

Construction Safety Program for the National Ignition Facility

D.W. Benjamin

July 30, 1999

U.S. Department of Energy

Lawrence
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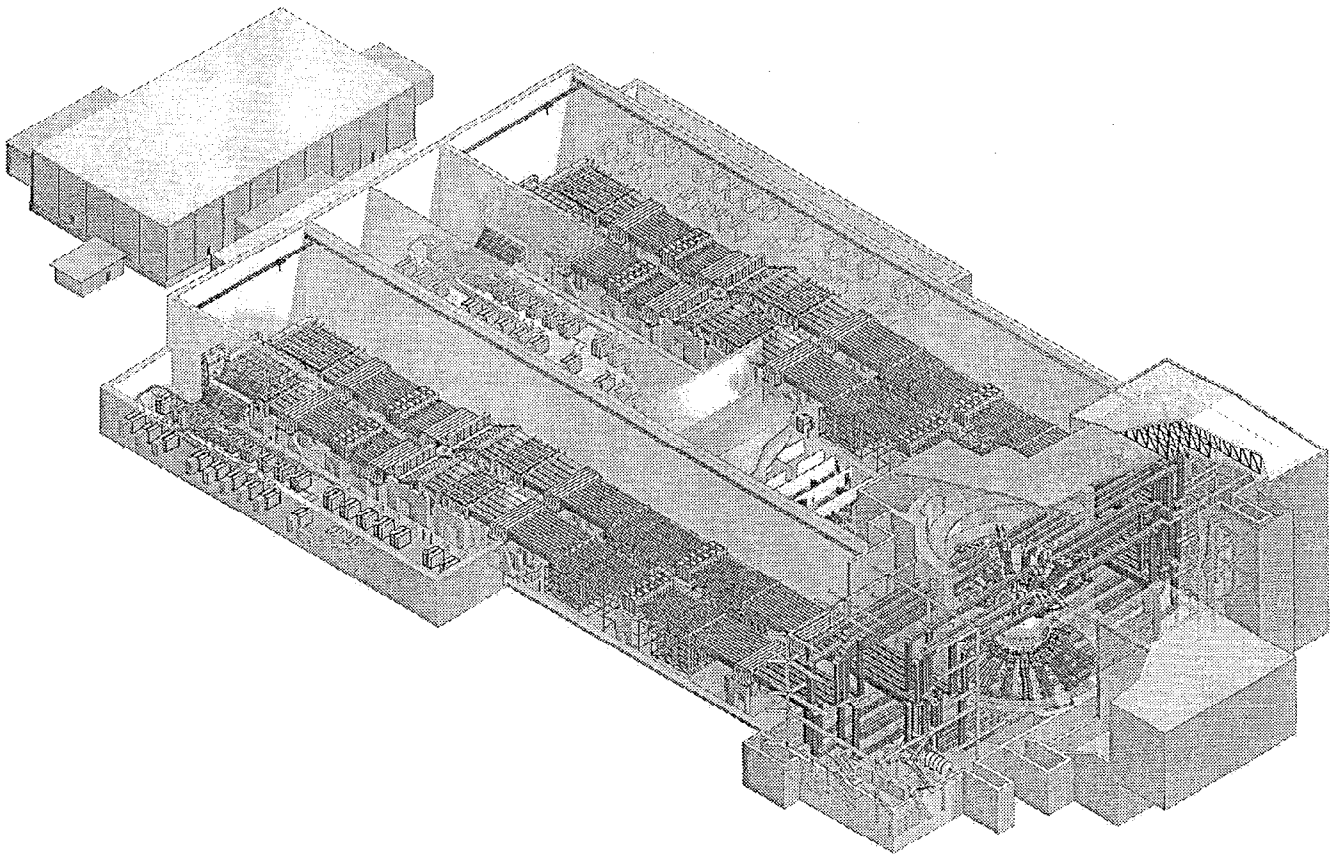
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Safety and Health Policy for the National Ignition Facility during Construction

Safety, health, and environment are priority considerations in the planning and execution of work related to the National Ignition Facility (NIF) Project at Lawrence Livermore National Laboratory (LLNL). The management of the NIF Project is committed to providing protection for NIF workers, LLNL site-wide workers and the public from hazards associated with the construction and operation of the NIF, and for providing a safe, healthful, and secure work environment for all persons directly involved with NIF. All work related to NIF construction and parallel operations during the construction period will be performed in a manner that preserves the quality of the environment and prevents property damage.

This policy is applicable to all LLNL, non-LLNL, and contractor/subcontractor employees working at the NIF Project site. The NIF Project site includes the NIF construction area plus the specific support areas listed in Appendix C.

The NIF Project will comply with all applicable safety, health and environmental laws, regulations, and requirements. Furthermore, LLNL, Laser Programs and NIF Management are committed to the enforcement of comprehensive safety and health rules. They will ensure that procedures are established and enforced during the construction period of the NIF to support the NIF Project goal objective of zero accidents.

It is the Project's policy to integrate safety into all aspects of work performed. A systematic approach will be followed when integrating safety into work planning and execution. This approach is based on the seven guiding principles of Integrated Safety Management contained in DOE Policy 450.4, *Safety Management System Policy*.

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List of Acronyms

ANSI	American National Standards Institute
APL	Assembly Point Leader
CAL/OSHA	California Occupational Safety and Health Administration
CBSC	California Building Standards Code
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CII	Construction Industry Institute
CSO	Construction Safety Officer
CSP	Construction Safety Program for the NIF
DefTrack	Laser Programs Directorate's ES&H deficiency tracking database
DOE	Department of Energy
DOT	Department of Transportation
EMC	Emergency Management Center
EMD	Emergency Management Division (of HCD)
EPA	Environmental Protection Agency
EPD	LLNL's Environmental Protection Department
ES&H	Environment, Safety, and Health
FHA	Fire Hazards Analysis
FSAR	Final Safety Analysis Report
FSP	Facility Safety Procedure
GISO	General Industry Safety Order
GFCI	Ground fault circuit interrupter
HCD	LLNL's Hazards Control Department
HCS	Hazard Communication Standard
HSD	LLNL's Health Services Department
HWM	LLNL's Hazardous Waste Management division
ICD	Interface Control Document
ICF	Inertial Confinement Fusion
ISM	Integrated Safety Management
IWS	Integration Work Sheet
IIPP	Injury and Illness Prevention Program
JHA	Job Hazards Analysis
LLIX	LLNL Telephone Exchange
LLNL	Lawrence Livermore National Laboratory
LTAB	Laser and Target Area Building
MAP	Mitigation Action Plan
MSDS	Material Safety Data Sheet
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NIF	National Ignition Facility
NRR	Noise Reduction Rating

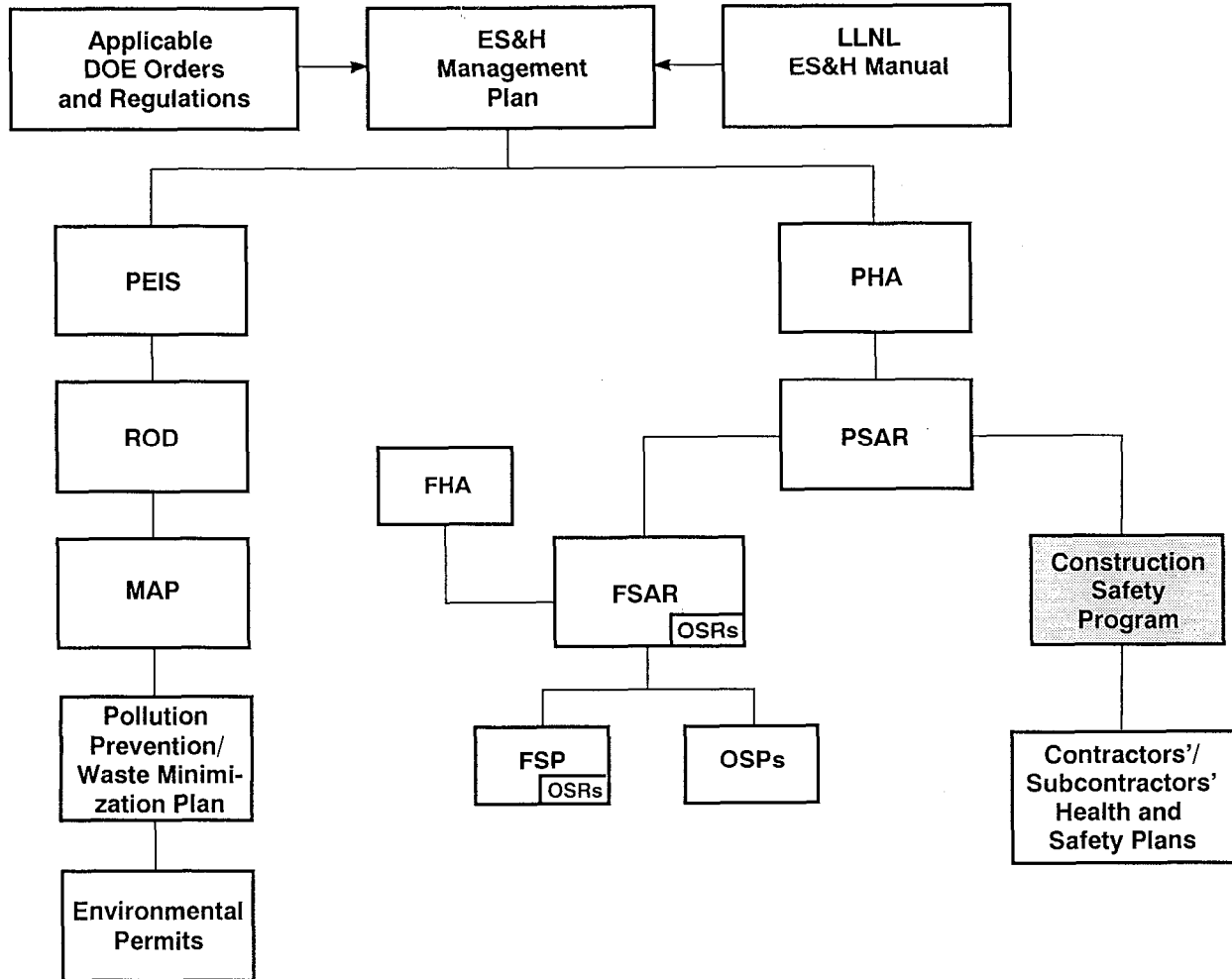
OAB	Optics Assembly Building
OCIP	Owner Controlled Insurance Program
ORR	Operational Readiness Review
OSHA	Occupational Safety and Health Administration
OSP	Operational Safety Plan
OSR	Operational Safety Requirement
OTP	Operational Test Procedures
PEIS	Programmatic Environmental Impact Statement
PHA	Preliminary Hazards Analysis
PPE	Personnel protective equipment
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QMC	Quality Managers of Construction
ROD	Record of Decision
SAAR	Supervisor's Accident Analysis Report
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SDR	System Design Requirement
SE	Special Equipment
SHP	Self-Help Program
SLO	Supplemental Labor Office
SWPPP	Storm Water Pollution Prevention Plan
UC	University of California
WAF	Work Authorization Form
WM/PPP	Waste Minimization/Pollution Prevention Plan

Document Hierarchy

This *Construction Safety Program* (CSP) document fits into the NIF Environment, Safety, and Health (ES&H) document hierarchy in the following way (see Figure 1). The *NIF ES&H Management Plan* is the top-level management document for environmental and occupational safety and health matters. It carries out the requirements of the *LLNL ES&H Manual*, applicable Department of Energy (DOE) Orders, and federal and state regulations (e.g., 10CFR835). The environmental documents that are developed (i.e., flow down) from the *NIF ES&H Management Plan* include the *Programmatic Environmental Impact Statement* (PEIS), *Record of Decision* (ROD), *Mitigation Action Plan* (MAP), *Waste Minimization/Pollution Prevention Plan* (WM/PPP), and the environmental permits. The occupational safety and health documents developed from the *NIF ES&H Management Plan* include the *Preliminary Hazards Analysis* (PHA), *Preliminary Safety Analysis Report* (PSAR), *Construction Safety Program* (this document), and (Construction) Health and Safety Plans for individual Elements of NIF.

The NIF installation, testing, and start-up activities are covered by this Construction Safety Program. At some point, initial experimental operations may occur simultaneously with installation, testing, and start-up activities in the Laser and Target Area Building (LTAB). The safety of the initial operations and the safety of interfaces between operations and installation, testing, and start-up are addressed in the LTAB *Final Safety Analysis Report* (FSAR)*. The final operational safety document for the LTAB will be the FSAR, which is implemented by the *Facility Safety Procedure*, *Operational Safety Requirements*, and *Operational Safety Plans*.

*Other NIF support facilities (e.g., Optics Assembly Building [OAB], B391W Optics Processing Development Laboratory (OPDL), B381 Frame Assembly Unit Assembly Area (FAUAA), etc.) are not covered in the LTAB FSAR; rather they have their own safety basis documents.



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Figure 1. NIF ES&H document hierarchy.

Introduction

The Construction Safety Program (CSP) for NIF sets forth the responsibilities, guidelines, rules, policies and regulations for all workers involved in the construction, special equipment installation, acceptance testing, and start-up of NIF at LLNL during the construction period of NIF. During this period, all workers are required to implement measures to create a universal awareness which promotes safe practice at the work site, and which will achieve NIF's management objectives in preventing accidents and illnesses. Construction safety for NIF is predicated on everyone performing their jobs in a manner that prevents job-related disabling injuries and illnesses.

Integrated Safety Management (ISM) is practiced in the execution of all activities associated with the NIF Project. The seven Principles of ISM are listed below:

- Line management is responsible for safety.
- Clear roles and responsibilities are established and maintained.
- Personnel possess competence commensurate with responsibilities.
- Resource allocations are balanced, making ES&H a priority in project planning and execution.
- Safety requirements are identified and implemented.
- Hazard controls are tailored to the project work.
- Operations are authorized before work begins.

The following five Core Functions are used to implement ISM:

- Define scope of work.
- Analyze hazards.
- Develop and implement controls.
- Perform work.
- Feedback and improve.

Successful application of the Principles of ISM is predicated on the proper implementation of the Core Functions when evaluating and controlling all activities. The CSP identifies how and where the Principles and Core Functions are to be implemented. NIF Project Control Policy 1.11 contains an attachment that lists other NIF Project documents that address the components of ISM.

The CSP outlines the minimum environment, safety, and health (ES&H) standards, LLNL policies and the Construction Industry Institute (CII) Zero Injury Techniques requirements that all workers at the NIF Project site shall adhere to during the construction period of NIF. It identifies the safety requirements, which the NIF organizational Elements (Facility and Infrastructure System, Final Optics System, Transportation and Handling System, Injection Laser System, Amplifier System,

Integrated Computer System, Beam Delivery and Diagnostics System, and Target Experimental System), contractors, and construction subcontractors must include in their safety plans for the construction period of the NIF and presents safety protocols and guidelines that workers shall follow to assure a safe and healthful work environment. However, the CSP does not cover the full spectrum of published safety, health and environmental standards that are mandated by law, the University of California's (UC) contract with the U.S. DOE for operating LLNL, and the PEIS for Stockpile Stewardship and Management. As such, NIF Elements, contractors, and subcontractors should not assume that they are only responsible for those standards that are referenced in the CSP or that those standards are current and quoted as published. Contractors and construction subcontractors who feel that their safety practices exceed current California and Federal OSHA standards, LLNL policies and CII Zero Injury Techniques requirements may provide a copy of their safety procedures to NIF Project Management for review and approval.

The CSP also identifies the ES&H responsibilities of LLNL employees, non-LLNL employees, contractors, subcontractors, and various levels of management within the NIF Project at LLNL. In addition, the CSP contains the responsibilities and functions of ES&H support organizations and administrative groups, and describes their interactions with the NIF Project.

Further, the CSP identifies work authorization requirements through the mandatory use of Inertial Confinement Fusion (ICF)/NIF Work Authorization Form (WAF) and Job Hazard Analysis (JHA) forms.

I. Responsibilities

It is the responsibility of all workers at the NIF Project site to perform work safely and in accordance with all LLNL policies as well the CSP. Workers at the site are accountable for their own safety and the safety of others who could be impacted by their activities. Certain organizations and workers performing supervisory roles have specified responsibilities for carrying out safety-related activities. Workers who perform supervisory functions have increased safety obligations. Management and supervisory workers may delegate safety authority to others in their line organizations; however, the accountability for safety performance and assurance is not transferable.

This section describes the line management organization responsibilities and interfaces regarding ES&H at the NIF Project Site. The responsibility definitions are consistent with the NIF Project Execution Plan. The line management organization is supported by Safety Officers and a Safety Coordinator. The NIF Project organization is shown in Figure 2.

This revision covers activities through completion of Facilities and Infrastructure. Prior to that point, an update will be prepared.

The responsibilities identified below primarily pertain to safety-related responsibilities of the individual(s), organization, or firm during the construction of NIF. The individual(s), organization, or firm may have additional responsibilities that are unrelated to safety during construction of the NIF or inadvertently omitted, and hence not mentioned. However, omission of such responsibilities does not preclude the individual(s), organization, or firm from fulfilling their responsibilities.

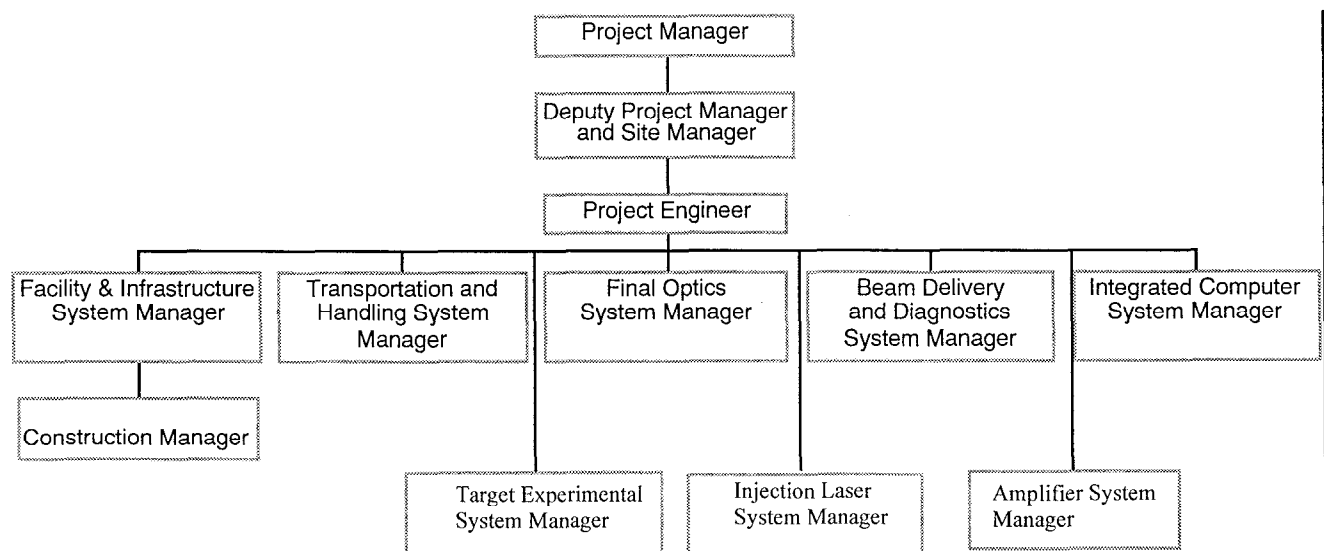


Figure 2. NIF Line Management Safety Responsibility for NIF Site Work.

I.A. NIF Project Office

I.A.1. Project Manager

The Project Manager, supported by the Principal Deputy Project Manager and Site Manager and the Project Engineer, has the overall contractor authority and responsibility for the execution of the NIF Project and will:

- Serve as the point of contact and interface with the DOE Field and Headquarters Office and other agencies.
- Establish and control the technical, cost, and schedule baselines and report project status against the baselines to the DOE. Serve as Chairman of the Level 3 Baseline Change Control Board that formally approves changes to the baselines. Enforce all policies and procedures to ensure that cost, schedule, and performance requirements will be achieved.
- Conduct NIF Project work in accordance with the applicable federal and state regulations, DOE Orders, and institutional standards, requirements, and procedures, as they pertain to ES&H issues.
- Ensure that environmental, safety, radiation protection, quality assurance, and security programs are established and maintained to meet applicable federal, state, and local regulatory requirements. Establish and approve the Construction Safety Program, including assuring adequate funding support.
- Plan and implement the facility construction, equipment procurement, and installation by working with the Project Engineer and the System Managers.
- Delegate responsibility to the Principal Deputy Project Manager and Site Manager for controlling access to the site and for administering ES&H rules and regulations for all personnel working at the site.
- Provide adequate funding for administering the CSP for the NIF.
- Approve the CSP for the NIF.

I.A.2. Principal Deputy Project Manager and Site Manager

The Principal Deputy Project Manager and Site Manager is the line manager responsible for establishing requirements for and maintaining safe working conditions at the NIF Project site and resolving conflicts related to implementing these requirements. The Principal Deputy Project Manager and Site Manager reports to the Project Manager and will:

- Control requirements for access to the site. This includes an extensive set of safety and training requirements.
- Concur on the content of the CSP and lower-tier safety documents.
- Assume Project lead for the direct reporting chain for site accidents and near misses to the Institution and the DOE (note: LLNL institutional systems feed the DOE accident-reporting system).

- Serve as voting member of the Level 3 Baseline Change Control Board.
- Carry out the Storm Water Pollution Prevention Plan (SWPPP) for the NIF Site and designated laydown areas.

I.A.3. Project Engineer

The Project Engineer is the line manager technical authority for the NIF Project controlling the technical baseline and implementation activities. The Project Engineer reports to the Project Manager and will:

- Manage the System Managers directing their cost, schedule, and technical performance.
- Exercise line management control over the ES&H aspects of NIF Project activities, including directly supporting development facilities working through the System Managers.
- Control the technical baseline assuring that proposed changes are properly reviewed; ensure that Title III engineering to document the as-installed condition of the NIF systems is carried out by the System Managers.
- Review development, prototype, and other test results to ensure that NIF performance will meet baseline technical and ES&H requirements.
- Ensure that interfaces between systems are documented and controlled.
- Ensure that NIF systems are ready for turnover to NIF Operations. Working through the System Managers, prepare the Readiness Packages (e.g., ATP results, as-built drawings, etc.) for the Management Pre-start and Readiness Reviews.

I.A.4 Assurance Manager

The Assurance Manager is responsible for the oversight of ES&H and quality aspects of the NIF Project. He/she reports directly to the Project Manager and will:

- Concur on the content of the CSP for the NIF and provide safety oversight.
- Perform safety analyses of NIF construction and operation: *Preliminary Hazards Analysis* (PHA), *Preliminary Safety Analysis Report* (PSAR), and *Final Safety Analysis Report* (FSAR) with Operational Safety Requirements (OSRs).
- Obtain the National Environmental Policy Act (NEPA) determination and the environmental permits.
- Prepare and ensure implementation of the ES&H Management Plan.
- Develop the construction safety team and the environmental and safety working group to review Project ES&H issues.
- Provide oversight that all applicable federal, state, and local ES&H regulations are followed.
- Interface with the DOE ES&H Manager and Laser Programs Assurance Office on all assurance issues.

- Oversee the NIF Occurrence and Accident Reporting Program.

I.A.5 System Managers

The System Managers (Facility and Infrastructure, Final Optics, Transportation and Handling, Injection Laser, Amplifier, Integrated Computer, Beam Delivery and Diagnostics, and Target Experimental) are line managers, each responsible for carrying out a major Project activity. They report to the Project Manager and will:

- Support the Contracting Officer in the bid/award process for contractors, ensuring that safety related requirements (Level 1 requires Facility and Infrastructure System Manager approval. For definitions of Level I and Level II see Section I.B, NIF Contractors and Subcontractors) are adequately implemented in the bid/award packages for contractors and subcontractors working at the site. Direct their contractors and subcontractors at the construction site.
- Ensure that LLNL employees, non-LLNL employees, contractors, subcontractors are performing all work in accordance with applicable ES&H standards and this CSP.
- Manage these groups responsible for the design, procurement, acceptance testing, and installation of their assigned system (e.g., Amplifier System).
- Prepare and control the System and Subsystem Design Requirements and Interface Control Documents for their assigned system.
- Assure that their assigned system meets NIF Project Quality Assurance (QA)/Quality Control (QC) requirements.
- Ensure that all work meets applicable ES&H and other regulatory requirements.
- Prepare and perform Acceptance Test Procedures.
- Coordinate and interface all site activities with the Facility and Infrastructure System Manager. Coordinate activities with other System Managers where interfaces exist.
- Ensure the development of JHAs or, if more appropriate, Operational Safety Plans (OSPs) (e.g., OSP for testing the 23,000-volt capacitor banks) for work under their responsibility.
- Conduct Title III engineering (e.g., field engineering and as-built drawings.)
- Identify institutional controls or establish their own specific implementing work controls (procedures) to carry out the ISM requirements of DOE Policy 450.4, *Safety Management System Policy*.
- Prepare systems for management pre-start and operational readiness review.

I.A.5.1 Facility and Infrastructure System Manager

The Facility and Infrastructure System Manager is responsible for the facility and infrastructure (spatial filter vessels, target chamber, etc.) systems. The Facility and Infrastructure System Manager reports to the Project Engineer and will:

- Manage and direct the Construction Manager, acting as the technical representative.
- Control access to the site (including work authorization) and administer the rules and regulations that must be adhered to by anyone working on the site.
- Manage the design, procurement, construction/installation, and acceptance testing of NIF Facility and Infrastructure systems.
- Prepare and control the Facility and Infrastructure Subsystem Design Requirements and Interface Control Documents.
- Develop specifications and procure infrastructure systems.
- Document that work-in-place meets all contractual requirements.
- Coordinate preparation of the Construction Plan and construction schedule.
- Anticipate and resolve space, equipment availability, personnel, and schedule conflicts while minimizing Project costs and achieving earliest schedule performance of NIF performance objectives. The Facility and Infrastructure System Manager has responsibility for the interface resolution between areas and systems on the site.
- Ensure that the Facility and Infrastructure Systems employees and contractors/subcontractors are performing all work in accordance with applicable ES&H standards and the CSP for the NIF.
- Working with the Assurance Manager, prepare and control the CSP and subcontractor Construction Health and Safety Plans and ensure that required environmental permits (e.g., SWPPP) are in place.
- Oversee implementation of Acceptance Test Procedures for Facility and Infrastructure system.
- Ensure that the QA plans and procedures are prepared and implemented; oversee the QC inspection.
- Serve as a member of the Level 4 Change Control Board.
- Concur with the System Managers on the determination of Level I contractors (see Section I.B for full explanation).
- Interface with LLNL on institutional matters, such as road improvement, parking, surveillance of soil, etc.

I.A.6. Reserved

I.A.7. Construction Manager

The Construction Manager is a line manager who shall manage the occupational safety and health of J. E. Sverdrup CRSS employees, contractors, and subcontractors (associated with the Facility and Infrastructure Element of the NIF) during the construction of the NIF experimental facilities. He/she manages through a Deputy and

Quality Managers of Construction (QMCs). The position reports to the Facility and Infrastructure System Manager and will:

- Monitor the construction activities of the Facility and Infrastructure Contractors/Subcontractors.
- Perform inspection, testing, and acceptance of the Facility and Infrastructure.
- Support the Contracting Officer in the bid/award process for contractors and subcontractors.
- Develop site specific safety and environmental video presentation and orientation required under OCIP for all necessary personnel.
- Develop and conduct a customized site-specific 10-hour OSHA construction safety class for all required contractor/subcontractor supervision.
- Verify that weekly safety briefings for Facility and Infrastructure contractors and subcontractors personnel are conducted.
- Conduct daily construction site safety audits, records and compliance reviews in randomly pre-selected areas for Facility and Infrastructure contractors/subcontractors.
- Act as Element liaison with the Safety Coordinator
- Chair and conduct site coordination meetings.
- Review the contractors'/subcontractors' safety plans for Facility and Infrastructure.
- Verify that all the contractors/subcontractors for Facility and Infrastructure are performing work in accordance with applicable ES&H standards.
- Verify that all Facility and Infrastructure worker safety education and orientation requirements (including applicable environmental orientation) are met.
- Review the results of the Facility and Infrastructure audits for compliance, recommendations made for correction and prevention of recurrence, and follow-up measures taken to develop compliance.
- Review records of all accidents experienced by Facility and Infrastructure workers.
- Keep Facility and Infrastructure contractor/subcontractor safety representatives advised on the adequacy of their safety program.
- Verify that the following safety requirements are met for Facility and Infrastructure contractors/subcontractors:
 - Implementation of the procedures outlined in the CII publication "Zero Injury Techniques."
 - Implementation of the procedures outlined in the CII publication "Managing Subcontractor Safety"

- Establishment and maintenance of a safe and healthy work environment by adherence to the guidelines and procedures issued in the latest document of the Federal, State, and site specific requirements.
- Implementation of the Substance and Alcohol Abuse Prevention Program.
- All Facility and Infrastructure personnel and contractors/subcontractors implement and abide by ES&H rules and regulations set forth by all regulatory agencies as well as those identified in the CSP for the NIF.
- Work activities are pre-planned in order to identify and control any safety and health issues which may pose a hazard to workers or others.
- Meetings are conducted with NIF Project Management to review accident prevention measures.
- NIF Management is knowledgeable of all contractor/subcontractor safety programs.
- Communications with contractors/subcontractors are maintained.
- CSP general requirements apply to visitors.
- Specific job safety training is completed.
- Safety audits are performed and deficiencies corrected.
- Investigation of all injuries, accidents, and incidents are conducted.
- Safety inspections with Facilities and Infrastructure contractors/subcontractors are reviewed.
- Job hazard analyses are performed.
- Facility and Infrastructure Construction Management safety personnel are assigned.
- Contractor/subcontractor safety records and performance audits are conducted.
- Contractor/subcontractor safety plan is reviewed for adequacy prior to contractor/subcontractor mobilization.
- LLNL representatives attend contractor/subcontractor safety meetings.

I.A.8. Reserved

I.A.9. Reserved

I.A.10. Safety Coordinator

The Safety Coordinator reports to the NIF Assurance Office and will: Assist the Principal Deputy Project Manager and Site Manager, Project Engineer, and System Managers with the coordination of concurrent construction site work activities related to ES&H among the NIF Elements. Act as an interface among NIF Elements on ES&H issues pertaining to the construction site work activities. Assist in resolution of any interferences related to ES&H issues among NIF Elements. Make final determination on issues of conflict (pertaining to ES&H) among NIF Elements. Oversee compliance with environmental permits and the Waste Minimization/Pollution Prevention Plan the Mitigation Action Plan, PEIS, etc. Act as the interface with DOE and other LLNL

programs and directorates on ES&H issues pertaining to the NIF Project and the construction site activities. Track ES&H deficiencies and status of resolution during construction of the NIF. Chair the Project Safety Team.

I.A.11. Construction Safety Officers

The Construction Safety Officers are assigned to the various Elements of the NIF and report to the appropriate System Manager. They are responsible for overseeing the safety of LLNL employees, non-LLNL employees, contractors and subcontractors associated with the NIF Element to which they are assigned during the construction of the NIF, and will:

- Support the appropriate System Manager responsible for the construction and/or equipment installation for a specific NIF system.
- Act as point contact and interface with Hazards Control ES&H Team on construction site related ES&H issues pertaining to the assigned NIF Element.
- Review ES&H aspects of construction site work of assigned Element with construction site work of other Elements.
- Assist with resolving ES&H issues.
- Review work practices of LLNL employees, non-LLNL employees, contractors, and subcontractors (associated with the assigned Element) to assure all work is being performed in accordance with applicable ES&H.
- Perform formal safety compliance audits and inspections, and document findings.
- Review results of safety compliance audits and inspections with the Project line management, provide recommendations for correction (and prevention of recurrence) of noncompliance findings, and identify necessary follow-up measures to ensure future compliance.
- Assist the Principal Deputy Project Manager and Site Manager with investigations of injuries, accidents, and incidents.
- Assist with preparation (and modifications) of Safety Plan(s) for their assigned NIF Element.
- Review Safety Plans of primary contractors/subcontractors to ensure such Plans are consistent with LLNL policies and the NIF Facilities requirements.
- Request and coordinate support of the Hazards Control ES&H Team to resolve specific safety issues.
- Serve as a member of the Project Safety Team.

I.A.12. Quality Managers of Construction

Persons serving as a Quality Manager of Construction (QMC) are line managers and the primary field contact to the contractors/subcontractors for a specific NIF

construction package under Facilities and Infrastructure. They report to the Construction Manager and will:

- Assure Quality Control for general, mechanical, and electrical engineering work.
- Monitor the contractor's/subcontractor's safety program on a day-to-day basis, including corrective action when deficiencies are identified.
- Notify the Construction Manager and responsible System Manager when improper working conditions are identified.

I.A.13. LLNL Employees

LLNL employees are University of California employees whose payroll and benefits are administered by LLNL. They will:

- Know and understand the ES&H requirements of their assignments and the potential hazards in the work area.
- Perform work assignments in full compliance with applicable ES&H requirements in Laboratory manuals, guidelines, and established in the Safety Plan of the NIF Element for which they are assigned.
- Participate in all training, personnel, and health monitoring programs required by LLNL, including this CSP for the NIF.
- Immediately correct or inform the responsible supervisor of any ES&H-related problems.

I.A.14. Non-LLNL Employees (Excluding NIF Facility and Infrastructure Contractors and Subcontractors)

Non-LLNL employees are visitors, students, participating guests, employees matrixed (or on assignment) from other National Laboratories, contract labor, supplemental labor and vendors, including those working for facility operations contractors. **Non-LLNL Employees for purposes of this document do not include NIF Facility and Infrastructure Contractors and Subcontractors (see Section I.B. for specifics).** Non-LLNL Employees will:

- Receive appropriate LLNL ES&H training, or equivalent, or shall be escorted and supervised by personnel knowledgeable in the hazards to which they may be exposed.
- Receive the same pre-placement and ongoing medical surveillance examinations as LLNL employees based on occupational exposure(s).
- Report all work-related injuries and illnesses to NIF Project Management.
- Use the same protective equipment and safety controls required for any employee working in the area.
- Follow all safety and health requirements of their own parent organization.

- Follow LLNL and requirements governing the safe and orderly conduct of operations.
- Not be assigned tasks or duties that expose them to hazards beyond that specified in their institutional contract and job description.
- Perform work assignments in accordance with applicable ES&H requirements in Laboratory manuals, guidelines, and established in the Health and Safety Plan of the NIF Element for which they are assigned.

With the exception of emergency first aid and respirator review and approval, Health Services does not routinely provide medical services to non-LLNL employees. Special examinations may be provided only if requested by LLNL management or is specified in contractual agreement.

I.B. NIF Contractors and Subcontractors

NIF Contractors and Subcontractors are firms (or individuals) that are contracted or subcontracted to perform specific work tasks on the NIF Project site. Included under this category are:

- J. E. Sverdrup CRSS (as related to their own employees).
- Firms or individuals contracted or subcontracted for NIF site work through the applicable NIF Element.

There are two levels of contractors (see Section V.E.1.1) from the standpoint of the formality of safety requirements: (1) Level I: Activity involving fewer than 10 employees on site, noncomplex/minor-hazard activity, short duration—less than 10 days on site.* (2) Level II: Any contractor operation of significantly complex/hazardous activity, or greater than 10 employees on site, or long (continuous) duration – more than 10 days on site.

* The Facility and Infrastructure System Manager must approve all Level I contracts.

- Firms or individuals contracted or subcontracted by any of the above contractors or subcontractors.

All NIF Contractors and Subcontractors shall:

- As a condition of their contract or subcontract, assume responsibility for the safety and health of their employees, agents, subcontractors and their employees, and other persons representing them on the Work Site.
- (Level II requirement) Assign an on-site **“Competent” Safety Representative** for each contractor or subcontractor whose duties include the protection of persons and property and the administration of the safety plan. The name of this individual shall be provided to the NIF Project Management upon award of the contract.

A “competent” *safety representative* is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them. A “competent” safety representative is also an individual who has received the proper OSHA training necessary to understand and properly address unsafe conditions surrounding construction site exposures.

- (Level II requirement) The contractor’s/subcontractor’s “competent” safety representative must also attend and complete the 10-hour OSHA safety training course. This training will be provided upon contractor’s request at no cost to the NIF.
- All contractors/subcontractors are required through CAL/OSHA’s Injury and Illness Prevention Program (IIPP) to investigate accidents/incidents and to determine cause and to develop/implement corrective actions to prevent reoccurrence. All contractors/subcontractors are responsible to notify immediately NIF Project Management regarding any near misses or accidents. Completed accident investigation reports, findings, and corrective measures should be faxed to NIF Project Management once completed.
- Comply with CAL/OSHA’s Title 8, Construction Safety Orders Article #3, Section 1509 IIPP and all applicable laws, regulations, ordinances, conditions of contract/subcontract, rules or orders of any public authority having jurisdiction relating to safety of persons or property.
- Ensure that all of their employees, subcontractors and their subcontractors’ employees, are briefed on the CSP for the NIF. All of their employees, subcontractors and their subcontractors’ employees are required to attend a 30-minute safety orientation session that will be provided by the Construction Manager in the on-site NIF Safety/Labor Relations trailer prior to performing any work on the site. Contractors/subcontractors shall, in accordance with law, adopt procedures providing that any employee who carelessly or callously disregards these rules or other applicable safety and health regulations shall be subject to disciplinary action up to and including discharge.
- Submit OSHA 200 logs and total man-hours worked on a monthly basis to the NIF Project Management.
- Have their safety representative participate in the safety walk-through meetings.
- The Contractor/Subcontractor shall ensure (with respect to their employees) that:
 - Prior to the performance of any work, each employee involved in the NIF Project knows and understands each of ES&H and security rules which applies to the job site in which he/she is performing for the Project.
 - Each employee assumes responsibility for his/her protection.
 - Personal protective equipment (inclusive of mandatory ANSI approved hard hat, appropriate NRR hearing protection, appropriate footwear & ANSI

approved safety glasses) shall be used where required and maintained in proper condition.

- 100% personal eye wear protection is required in all construction work areas and shall be worn at all times by employees of both the contractor and subcontractors, regardless of tier. Eyewear shall conform to applicable ANSI Z87.1.
- Employees on walking and or working surfaces with unprotected sides or edges six feet (6) or higher above a lower level shall be protected from falling by the use of guardrails or personal fall arrest systems. This shall include but is not limited to employees on the face of form work, reinforcing steel, or structural steel during and after erection, exterior and interior masonry work, roofing work, window installation, electrical work, mechanical work, and all other trades that require work in areas where the height exceeds six (6) feet above the ground or work surface.
- Employees do not engage in practical jokes and/or horseplay.
- An employee is not undertaking work which he or she is not properly qualified or equipped to do. In this regard, each employee shall be required to attend Safety Training Meetings weekly and sign an attendance sheet.
- Employees are aware that use of intoxicating or unlawful substances during working hours is forbidden and any violation will be sufficient cause for dismissal and possible arrest. Employees reporting for work while under the influence of intoxicating or unlawful substances will not be allowed to assume their duties nor will they be allowed to return to the construction site.
- Employees are informed of proper storage requirements for hazardous materials (flammable, combustible, toxic, etc.) and hazardous wastes in accordance with the NIF Construction Storm Water Pollution Prevention Plan.
- Each employee is to be provided with information and training on the Hazard Communication Standard the employer's Hazard Communication Program, and Material Safety Data Sheets (MSDSs). In addition, each contractor/subcontractor is responsible for making provisions to provide copies of MSDSs, and provide information on measures that need to be taken for personnel protection to all affected employees of other employers. Copies of MSDSs shall also be provided to the NIF Project Management.
- Contractors/subcontractors are responsible for daily cleaning of work areas and debris removal.
- Each employee must always know where he or she is in relation to work in progress, and avoid hazardous situations around equipment or construction in progress. Employees must advise supervisory personnel of their work location. They shall not work alone in an isolated area until arrangements have been made for periodic contact with another employee or supervision.
- Employees complete a pre-shift self-inspection checklist for safety hazards, and discrepancies to be corrected before work begins.

- One week prior to construction activities involving either construction operations or other hazardous operations, a JHA shall be prepared and submitted to NIF Project Management for review and approval.
- At the beginning of each shift there will be at least a 5 minute safety meeting to discuss the days activity with each crew and the activity they are to perform.
- Provide modified duty when available and case management procedures for all injured employees.
- Submit to the Construction Manager:
 - (Level II requirement) A site-specific safety plan, pre-work review and acceptance required.
Note: A specific safety plan may not be required if the contractor or subcontractor is specifically addressed in the safety plan for the primary contractor or primary subcontractor.
 - (Level II requirement) Name and qualifications of an on-site safety representative. (Note: Preapproval of the safety representative by the Construction Manager must occur prior to on-site work).
 - Current copies of weekly tool box/tailgate safety meetings, when requested.
 - JHAs as required.
 - Weekly project safety inspection and deficiency reports with solutions and corrections included.
 - Current inventory of Hazardous Substances on site, accompanied by MSDSs.
 - New employee orientation log.
 - Current copy of OSHA 200 log for the project.
 - Substance and Alcohol Abuse Prevention program.
 - Completed accident, injury and incident reports within 24 hours of occurrence.
 - A summary of all accidents and injuries including first aid to be submitted weekly.

I.C. Lasers Program Assurance Office

The Lasers Programs Assurance Office provides a central programmatic interface and assurance function for ES&H activities. Responsibilities include:

- Preparing Program-wide ES&H plans.
- Monitoring and inspecting Program activities to assure that they are in compliance with Program and LLNL ES&H requirements.
- Track ES&H deficiencies and status of resolution (i.e., administer DefTrack).
- Review Occurrence Reports and report incidences to the DOE.

I.D. LLNL Hazards Control Department

The LLNL Hazards Control Department (HCD), which reports to the Laboratory Site Manager, assists Laboratory programs with reducing the risk of workplace hazards by providing expertise, guidance, and services. The goals of HCD's risk reduction efforts are to prevent accidents, maintain a safe workplace, minimize exposure to harmful agents, and control the impact that emergency situations may have.

Two divisions of the department will provide support during construction of the NIF Project as follows:

I.D.1. Environment, Safety, and Health Team 2

ES&H Team 2 provides technical and oversight support to the NIF Project Office including the NIF Elements. ES&H Team 2 will also assist in the coordination of the Construction Health & Safety Programs for the NIF's contractors/subcontractors. It is a key interface between the NIF Project Office (and its Elements) and the LLNL ES&H support organizations. The team is comprised of safety and health specialists and technicians from HCD. In addition, specialists are assigned to ES&H Team 2 from the LLNL Environmental Protection Department (EPD) and the LLNL Health Services Department (HSD). The Division Leader for ES&H Team 2 is a member of the NIF Environment & Safety Working Group and will concur with the CSP for the NIF (this document). During construction of the NIF Project, the Division Leader may appoint one or more Construction Safety Officers (CSO) to the various NIF Elements, and assign them primary responsibility to support administration of the CSP for the NIF.

The team's primary responsibilities include:

- Review of safety related materials and submittals from the NIF Project Office and the NIF Elements, which includes review of Construction Safety Plans submitted by Level II/primary contractors/subcontractors.
- Audit of the NIF Project's safety performance, and advise the NIF Project Office and the Elements of their findings.
- Provide interpretation of all applicable health and safety codes in a manner consistent with University/Laboratory policies.
- Provide support during emergencies and as required during normal activities on the NIF Project site.
- Assist the NIF Office (including the NIF Elements) in identifying, analyzing and mitigating ES&H hazards and concerns.
- Advise the NIF Project Office and NIF Elements on appropriate ES&H-related controls needed to eliminate or minimize the identified hazards and concerns posed by NIF construction activities, including special equipment installation and initial activation and operation of the NIF during the construction period of the NIF.

- Periodically audit and document the NIF Project site for compliance with the requirements of this document, and advise the NIF Project Office and NIF Elements of noncompliance issues.
- Take appropriate steps to ensure that any activity on the NIF Project site that presents an imminent, uncontrolled danger to human safety, health, or the environment is immediately stopped.
- Assist the NIF Project Office, NIF Elements and Lasers Program Assurance Office during the investigation of accidents or incidents, and coordinates collection of certain required data for University/LLNL record-keeping purposes.
- Supervise the activities of the construction safety officers and engineers, technicians, and other ES&H disciplines.
- Assist in the preparation of written safety procedures e.g., Operational Safety Plans (OSPs).
- Provided technical support to the safety elements of the Readiness Reviews.
- Direct the activities of the on-site ES&H Technician.

I.D.2. Emergency Management Division

HCD, through its Emergency Management Division (EMD), manages the LLNL Fire Department and the LLNL On-Site Emergency Preparedness Program. The Fire Department provides a 3 to 5 minute response to fire, medical, and hazardous material incidents at the NIF Project site. The Fire Department will provide Basic and Advanced Life Support emergency care and emergency medical transport, for injuries or illnesses on the NIF Project site. The Fire Department on-scene Incident Commander has authority to call and direct appropriate LLNL and external resources, including ES&H Team 2, Health Service Department, EPD, Livermore City/Alameda County fire units to control emergencies on the NIF Project site. The Fire Department is also in charge of the issuance of burn permits and must approve of all fire safety system (sprinkler, fire, water, or alarm) outages. The Fire Department may also inspect the site to insure compliance with the LLNL fire protection program, including proper emergency vehicle access.

The Division's Emergency Preparedness Administrator will assist the NIF Project Office in developing appropriate Self-Help plans for addressing site-wide emergency events.

I.E. Risk Management Office

The Risk Management Office is part of the Staff Relations Division of LLNL's Human Resources. Responsibilities include:

- Manage the Laboratory's Self-Insurance Program, which includes the Workers' Compensation and general liability programs.

- Maintain an awareness of current statutes, DOE orders, and other legal requirements to make sure the Laboratory complies with the State of California Workers' Compensation and other legal and financial mandates.
- Manage or coordinate the Laboratory's responses to any audits related to Workers' Compensation or insurance programs.
- Procure special insurance to meet unique risks.
- Serve as a resource to Laboratory management on insurance matters and requirements.

I.F. Owner Controlled Insurance Program (OCIP) for NIF's Facility and Infrastructure

The Owner Controlled Insurance Program (OCIP) for the NIF is an insurance program managed by the Facility and Infrastructure Element of the NIF and is designed to provide insurance coverage to construction contractors and subcontractors while providing cost saving to the NIF Project. The OCIP will provide Workers Compensation, Builders Risk, and General and Excess Liability insurance coverage **SOLELY** to the construction contractors and subcontractors working for the Facility and Infrastructure Element of the NIF.

As part of OCIP, NIF Project Management incorporated Zero Injury Safety Techniques during the construction of the NIF to reduce the potential of industrial injury at the work site from the substantial number of activities simultaneously occurring on the site. As such, all workers working at the NIF Project Site will be required to follow the "Zero Injury Safety Techniques." The Techniques that apply to all Elements are incorporated into the CSP for the NIF.

The following requirements of the OCIP pertain solely to Facility and Infrastructure Contractors and Subcontractors:

- The broker will provide administration of the OCIP for the Facility and Infrastructure Element of the NIF Project at LLNL, which will include monthly loss analysis reports.
- The broker will provide monthly loss reports and a monthly summary of safety activities which identifies exposures and recommendations to mitigate such exposures.
- The broker will provide, as requested, Safety Consultant services to assist Facility and Infrastructure Management, inclusive of:
 - physical hazards site surveys
 - attendance at pre-construction and safety committee meetings
 - participation in the contractor's safety orientation
 - technical review and interpretation of standards/regulations

- The broker and the carrier representatives will monitor the site Loss Prevention Program and assist participating contractors and subcontractors as a technical resource as needed.
- The broker and the carrier will perform audits of the Health & Safety Plans for the Facility and Infrastructure contractors and subcontractors as requested.
- Both parties will review loss history, trend occurrences and recommend management controls to minimize exposures to loss.
- The broker will provide quarterly status reports for the NIF OCIP. Include in the report:
 - Safety Compliance Records of project status for participating contractors, subcontractors, and other project participants.
 - Statistical comparisons of participating contractors and subcontractors to national averages and to each other.
 - Claims cost and loss ratio comparisons of contractors and subcontractors.

I.G. Project Safety Team

The Project Safety Team shall consist of individuals from LLNL support organizations, the NIF Project Office, the NIF Element, and the Department of Energy.

The Team shall strive to meet the goals and objectives within the CSP for the NIF, inclusive of:

- Keeping the NIF Project Manager and Principal Deputy Project Manager and Site Manager informed on events and progress pertaining to ES&H issues.
- Monitoring the development of the CSP and confirming that the following items are appropriately addressed:
 - Occupational Safety
 - Occupational Health
 - Employee ES&H Orientation & Training
 - Potential Hazards
 - Accident Investigations
 - Documentation for Site Audits and deficiencies resolution.
 - Equipment Inspections
 - Environmental Monitoring and Regulatory Compliance
 - Emergency Contingency Plans (medical, fire, etc.)
- Confirm that worker ES&H education and orientation requirements are met.
- Verify that safety briefings are conducted.
- Conduct construction site safety compliance audits and record reviews in pre-selected work areas of the Construction Site. Audits will be coordinated by the cognizant System Manager and the Construction Safety Officer.

- Review the results of the audits for compliance, recommendations made for correction and prevention of recurrence, and follow-up measures taken to ensure compliance.
- Review records of all accidents experienced by LLNL employee, non-LLNL employees, contractors or subcontractors.
- Provide recommendations for material and personnel resources required to effectively and efficiently achieve the requirements of the CSP for the NIF.

II. Stop-Work Authority and Procedures

An operation or situation that is perceived to present a high risk to the health and safety of employees, the public, and the environment can be stopped immediately by any Laboratory employee, DOE representative, or contractor or subcontractor employee providing support to the NIF Project. The stop-work procedure at the Laboratory (see section 1.9 of the *LLNL ES&H Manual*) applies to all NIF construction activities. The stop-work procedure will be used only where imminent-danger situations exist (i.e., where an immediate likelihood of death or serious harm to personnel is reasonably expected). A stop-work order affects only those areas immediately involved in the hazardous situation. When a stop-work order is issued on the NIF Project site, the NIF Safety Coordinator and the Division Leader for ES&H Team 2 shall be immediately notified by the Facility and Infrastructure System Manager , Construction Manager , other cognizant System Manager, or on-site Safety personnel.

II.A. Imminent Danger Situations

A stop-work order is normally issued by the Facility and Infrastructure System Manager , Construction Manager, other cognizant System Manager, Safety Coordinator, Construction Safety Officer, or the QMC. If they are absent and a contractor's/subcontractor's personnel are involved in an imminent-danger situation, Hazards Control personnel are authorized to directly contact the personnel and stop the operation. The QMC, Facility and Infrastructure System Manager, Construction Manager, other System Manager, Construction Safety Officer, or Safety Coordinator shall then be immediately located and contacted by Hazards Control and informed of the stop-work order. Imminently dangerous situations must be mitigated immediately.

II.B. Other Situations

A stop-work order may be issued by the Facility and Infrastructure System Manager or the Construction Manager for a portion of the work area(s) or the entire work area when, in his/her opinion, the work area is not being maintained according to the requirements of this document and/or the contractor's/subcontractor's Health & Safety Plan. The stop-work order will be in effect until the contractor/subcontractor resolves the problem(s) and brings the work area(s) to satisfactory conformance with health and safety requirements. Stop-work orders are normally not issued for this reason unless the contractor/subcontractor shows a consistent disregard for safety or ignores/refuses to correct deficiencies when they are discovered.

II.C. Differences of Opinion

Differences of opinion (relative to a stop-work order) between the Hazards Control representation, Facility and Infrastructure System Manager , Construction Manager, other System Manager, Construction Safety Officer, Safety Coordinator, or QMC concerning a stop-work order shall immediately be referred to their respective line management for resolution.

II.D. Resumption of Work

After a stop-work order has been issued, a resumption of work requires the concurrence of the NIF Assurance Manager or Safety Coordinator and the Division Leader for ES&H Team 2.

A formal Incident Analysis Report may be required after each instance in which work has been stopped (reference section 4.08 of the LLNL *ES&H Manual*).

III. Accident/Incidents/Safety-Related Problems and Deficiencies

III.A. Emergency Assistance Procedures

All calls for emergency assistance, whether they be for medical aid, fire fighting, rescue, etc. will be requested by telephone through the LLNL Hazards Control Department's Emergency Management Division (EMD) Dispatch Center by dialing 911 from an on-site LLNL telephone or 447-6880 from a cellular telephone or other telephone that is not connected to the LLNL Telephone Exchange (LLIX). Calls to the Dispatch Center are answered by an EMD Dispatcher, who will send fire and/or paramedics units to the emergency at the NIF site. A Hazards Control Department Health and Safety Technician will also respond to all emergencies called into the Dispatch Center. As appropriate EMD may request other LLNL or external resources to assist in control and mitigation of the emergency incident. **The EMD is in charge of the incident scene until it is turned over to the local authority.**

III.B. Self-Help Planning

LLNL realizes that during a major emergency, such as an earthquake, external help may not be immediately available. Therefore, the philosophy of emergency preparedness at LLNL relies upon the resources of individual organizations on-site to protect the welfare of Laboratory workers, this program is known as the "Self-Help Program" (SHP).

For the construction phases of the NIF, the NIF Project Office will be responsible for preparing and maintaining a SHP plan to address the impact that major LLNL emergency situations would have on the NIF Project site. The NIF Project Office shall consult with both the Laser Program and LLNL Self-Help Managers on the development of this plan. The plan at a minimum shall provide for:

- Accounting of personnel working on the NIF site.
- Maintaining the safety and well being of personnel on the NIF site.
- First-aid response in the absence of assistance from LLNL resources.
- Locating and rescuing trapped or injured personnel.
- Locating and reporting obvious damage to facilities.
- Control of personnel on the NIF site until LLNL site evacuation plans have been coordinated by the LLNL Emergency Management Center (EMC) and external local law enforcement authorities (e.g., CHP, Livermore Police).

LLNL is divided into self-help zones, each under the direction of a zone supervisor—the main NIF Project site is located in Self-Help Zone 6. Within each zone, there are fixed assembly points—the NIF Project site has its own assembly point. The principal assembly point for the NIF Project site is Assembly Point 6, which is located along the chain link fence to the north of the NIF contractor' offices and laydown areas (formerly called Kirchbaum Field). Additional NIF satellite assembly points are designated by contractor/construction package as shown on an assembly point map. Each assembly point has a leader who directs local emergency activities from these locations. The zone supervisor provides advice and recommendations to the Assembly Point Leader (APL) and keeps them advised of conditions on the LLNL site and within the zone. They are also responsible for relaying EMC orders to zone personnel, including those on the NIF Project site.

At a minimum the NIF Project Office will designate an APL for the NIF Project site, who upon activation of the LLNL Self-Help Program shall supervise emergency activities on the NIF Project site. With respect to the NIF Project site their responsibilities include: accountability, care, and protection of personnel; first aid, transporting the injured, situation assessment and reporting, and protection of facilities within the site; and search and rescue operations by the volunteer re-entry (sweep) teams. The APL will request assistance for the NIF site as needed. The APL will communicate information (e.g., personnel accountability, injury/damage reports) to the Laser Program Zone Supervisor/Control Point.

III.B.1 NIF Self-Help Plan – NIF Emergency Procedures

In the event of an emergency or multiple casualty incident, all NIF Project site employees (on the NIF site, in the construction trailers, and at other NIF associated sites) will cease work immediately and report to the assembly points as designated by Contractor/Construction Package shown on the assembly point map. If readily accessible, employees will shut down any equipment in their immediate area prior to reporting to their assembly point. Employees reporting to assembly points other than the one at the NIF Project site shall follow the instructions of the Assembly Point Leader for that area.

Employees should use the “buddy” system to assist personnel, perform required first aid, and deliver injured employees to the **Triage Center**, but should not move severely injured employees. The name and location of these personnel should be reported immediately to the **Deputy Assembly Point Leader/Contractor Representative (DAPL/CR)** for disposition upon arriving at their designated assembly point.

The **Assembly Point Leader (APL)** for the NIF Project will report to the **Control Center** and supervise emergency activities on the NIF site. The **Control Center** for the emergency will be established in the NIF Field Construction Office trailer T5977, Conference Room 105. The APL will be aided by **Control Center Leaders (CCLs)** who

will assemble in this conference room to manage the assistance and evacuation of NIF Project employees. A radio from each Prime Contractor will be delivered to the CCLs to facilitate communication between groups. If the T5977 Conference Room 105 is unusable, another location will be selected from available structures.

The DAPL/CRs will assemble at their designated assembly points and will perform a roll-call, dispatch CPR-trained employees to the **Triage Center**, assign contractor staff to escort uninjured/nonessential employees to the parking area for vacating the site, and establish lists of missing and injured employees. The DAPL/CRs will report these employees to the CCLs, who will in turn notify the **Search and Rescue Teams** and APL for immediate disposition.

The **Search Team** will investigate the site for missing/injured employees not accounted for in the roll-calls and assess the extent of damage to the site structures, arranging for the cordoning-off of areas that they deem to be unsafe for entry. These areas will be reported to the CCLs, who will maintain an updated map identifying damaged areas and stay-out zones.

The **Rescue Team**, supplemented from the gathering at the roll call by the DAPL/CRs, will be responsible for assembling the required tools and equipment necessary to support the **Search Team** in the retrieval and delivery of injured employees to the **Triage Center** and in the securing of hazardous areas.

The **First Aid Team** will report to the **Triage Center** area and operate the **Triage Center** for the processing and aid of injured employees. When all injured employees have been assisted and/or delivered to appropriate medical care, the **Triage Center** will shut down.

Once employees have been evacuated, DAPL/CRs will report to the CCLs to assist with the required shut down of utility systems (power, water, natural gas, compressed air, and other gas systems, etc.) in coordination with LLNL personnel.

All teams will remain in place until the site is secured, vacated of personnel, and dismissed by the APL.

An assembly point map showing where each contractor organization is to assemble is available at the NIF Field Construction Office (Trailer 5977). A copy of this map should be posted at each contractor's NIF site office area.

A list of names for APL, DAPL/CRs, CCLs, and other emergency personnel is maintained with the Self-Help supplies at the main NIF assembly point.

Important Telephone Numbers:

Lawrence Livermore National Laboratory Emergency Number for ALL Emergencies: (Fire, Medical, and Security)

911 from on-site (Lab) telephones

925-447-6880 from off-site (e.g., contractor's) and cell phones

NIF Field Construction Office, Trailer 5977 **Control Center** (Conference Rm 105)
925-423-7542

NIF Field Construction Office Receptionist.....925-423-7564

Hazards Control ES&H Team 2: (normal working hours) 925-422-6126

(after normal working hours) 925-422-7595

(Team 2 Cellular) 925-998-1892

(Team 2 Leader Pager)_____925-423-7705

Pager 04017

Laser Program Command Center at Trailer 3724 925-423-7816

(Across parking lot west of Target Chamber Assembly Area)

LLNL Maintenance Mechanics (24 hours a day) 925-422-9762

III.C. Flooding

The NIF Project site is located above the 100-year flood plain and will not be affected by flood of this magnitude. The main threat from flooding at the NIF Project Site is due to overflow of the Arroyo Las Positas from excessive precipitation (such as that which may occur during a 2000 year flood). Generally, severe flooding from excess precipitation develops relatively slowly. This would allow the opportunity for mitigative actions to be taken, such as securing hazardous material inventories and moving them to safe locations.

Mitigative actions for hazardous material inventories will be initiated whenever **ALL** of the following conditions are met:

1. The Arroyo Las Positas has reached maximum capacity.
2. Rainfall is occurring and continued rain is forecasted.
3. Large pools of standing water exist and are increasing in size on the Construction Site.

Mitigative actions will consist of moving hazardous material inventories to a secured, covered area/ structure on the LLNL Site which is located on higher ground, and anchoring or weighting items if left at ground level.

Each contractor/subcontractor is responsible for taking appropriate actions for the inventories under their control. NIF Construction Management, and as necessary LLNL emergency management/response personnel, will oversee flood mitigation activities.

III.D. Medical Services and First Aid

Employers on construction sites are required by OSHA to insure the availability of medical personnel for advice and consultation on matters of occupational health. This section describes how this will occur on the NIF Project site.

On a 24-hour basis, EMD is available to dispatch paramedics to seriously injured individuals on the NIF Project site and will arrange to transport injured individuals to appropriate medical treatment facilities—either on or off of the LLNL site.

The NIF Facility and Infrastructure Element has not elected to have its contractors/subcontractors use LLNL's Health Services Department for first aid.

As authorized by NIF Project Management, other contractors/ subcontractors may elect to utilize HSD for providing emergency first aid to their employees working on the NIF Project (refer to contract terms). If HSD is not used, the contractor/subcontractor shall have available at their work site a person—who has a valid certificate in first-aid training from the American Red Cross or equivalent training that can be verified by documentary evidence—to render first aid when required.

Each contractor/subcontractor shall have at their work site physician approved first-aid supplies that are easily accessible to their employees when required. First-aid kits used for this purpose shall be in weatherproof containers with individually sealed packages for each type of item. The contents of the first-aid kit shall be checked by each contractor/subcontractor at least weekly to ensure that the expended items are replaced.

In the case of less serious injury or illness, all NIF contractors/ subcontractors shall determine in advance of their working on the NIF Project site where their employees are to be treated. This determination shall be clearly noted in their safety plans and communicated to their employees. LLNL employees will be treated at HSD. Non-LLNL employees will be treated in accordance with the provisions and agreements contained in their employer's individual contract with the University/LLNL. Persons with minor injuries may be transported to local medical facilities by supervisors, coworkers, or by themselves as appropriate.

If any individual (employee, contractor, subcontractor, visitor, etc.) of the NIF Construction Project notifies HSD of an occupational illness or injury, Health Services will relay pertinent information to the Hazards Control Department. Hazards Control will then initiate a Supervisor's Accident Analysis Report (SAAR) and forward a copy to the NIF Project Management so that the appropriate investigation may be conducted (see III.E.)

III.D.1 Health Services Availability

During normal weekday working hours (8:00 A.M. to 4:45 P.M.): For LLNL employees: first aid and medical treatment cases may be referred to HSD (Building 663) for emergency evaluation and emergency treatment, and for other services including medical treatment and case management as arranged for by NIF Project Management. For contractor/subcontractor, and non-LLNL employees: further treatment beyond emergency care will have to be arranged by the cognizant party or employer.

After normal working hours (before 8:00 A.M. or after 4:45 P.M. and on weekends): For LLNL employees—all nonemergency first aid and medical treatment cases will be referred to either Valley Care Medical Center, Eden Medical Center's Trauma Clinic, or to the nearest medical provider of choice. For contractor/subcontractor employees—nonemergency first aid and medical treatment cases will be referred as called for in the OCIP program or local labor agreements.

For LLNL employees: on-site medical personnel may be contacted directly by calling:

LLNL Health Services – 925-422-7459*

III.E. Reporting and Investigation Procedures

III.E.1. Policy and Scope

The timely evaluation of accidents/incidents and “near misses” is a valuable component of ISM to provide feedback and improvement to the safety process. It is the policy of the NIF Project to investigate all accidents/incidents related to the construction program that result in personnel injury or illness, damage to buildings or equipment, or impact to the environment, as a result of an accident or natural phenomena. As a valuable management tool, “near misses” may also be investigated for the prevention of accidents and detecting trends. “Near miss” accidents/incidents are events or a series of events that could have resulted in serious injury or illness or property damage, but did not due to circumstances or changes in events. It is the construction contractor's/subcontractor's obligation to investigate all occurrences, provide all information outlined below, and submit the information to Construction Management. Contractors/Subcontractors shall cooperate fully with the investigation of occurrences conducted by LLNL, the University of California, or the U.S. DOE.

*NOTE: This telephone number should not be used for emergencies. It should be used only when medical advice is needed concerning first-aid type injuries or when complications might arise following release from medical care. This number should also be used when there are questions regarding medical problems and where to go for treatment and care.

III.E.2. Purpose

The purpose of investigating job-related accidents and illness is:

- To determine cause for the purpose of preventing recurrence, and in some instances, to determine whether gross negligence was involved.
- To comply with applicable federal, state, and local codes and regulations and contractual requirements relating to loss and occurrence reporting.
- To provide documentation of occupational injuries and illnesses, and to assist in Workers' Compensation claims management.
- To verify data accuracy prior to external release of information.
- To comply with LLNL Incident Analysis and Lessons Learned requirements.

III.E.3. Occupational Injuries/Illnesses Notification and Reporting

All individuals who are injured on the NIF Project site, however minor, or suspect they have developed an occupational illness shall immediately notify their on-site supervisor or NIF Project contact. In turn, the on-site supervisor or NIF Project contact will immediately notify the NIF Construction Manager, Construction Safety Officer, or NIF Safety Coordinator who shall immediately evaluate the seriousness of the injury for additional internal notification and internal reporting (see III.E.4, III.E.5, and III.E.6).

"Near misses" are to be reported by the construction contractor/subcontractor to the Facility and Infrastructure System Manager or appropriate System Manager (responsible authority). The responsible authority shall determine if an incident is worthy of being tracked/trended as a "near miss." The responsible authority can request that the "near miss" be reviewed by the NIF Project Safety Team for lessons learned and for the determination of its root cause.

Examples of candidate "near miss" incidents may include but are not limited to:

- A. Dropping a load/rigging failure without injury or damage to the load.
 - 1. A load of materials is rigged and hoisted, but the sling jumps out of a hook equipped with a safety latch, and the load falls.
- B. Failure of protective equipment/procedures that could have resulted in injury or property damage.
 - 1. A lanyard pulls apart when tugged on by the worker who does not actually fall.
 - 2. A worker works on or near energized equipment that should have been locked out and tagged (violation of lockout/tagout procedure).
- C. Personnel exposed to dangerous electrical hazards without receiving an electrical shock.
 - 1. A worker drills or cuts into a conduit with an energized power line inside.
 - 2. A backhoe is operated near a power line that was locked out and tagged correctly. However, the operator was not aware of the lockout, and the organization controlling the lockout was not aware of the operator.

- D. Tools/material falling from overhead work zone without striking personnel below.
 - 1. A bucket of bolts gets tipped off a beam and lands three stories below. The area below was not barricaded.
- E. Unsafe work methods/practices/conditions that could result in injury or property damage.
 - 1. A worker falls but is protected by a harness and lanyard.
 - 2. An aerial lift tips two workers out, but the workers are protected by their harnesses and lanyards.
 - 3. An unsecured ladder tips over and throws the worker to the ground. The worker is unhurt.
 - 4. A grinding wheel explodes into pieces on a grinder not equipped with the proper guards. The worker is not struck by the pieces.
- F. Structures that collapse or fall over.
 - 1. A wall form tips over but does not strike or injure a worker.
 - 2. Trench shoring collapses, and the excavation falls in without a worker present.

LLNL employees and non-LLNL employees shall report injuries, occupational illnesses, and “near misses” in accordance with existing LLNL procedures and their contractual requirements.

III.E.4. Incident Reporting

In addition to personnel injury or illness reporting requirements as described in Section III.E.3, above, all incidents which result in damage to buildings, materials, or equipment; reportable releases to the environment of hazardous materials; violation of environmental permit conditions; Safeguard and Security violations; or transportation accidents must be reported to the NIF Construction Management immediately. The NIF Construction Management will immediately notify the appropriate LLNL Organization, and the NIF Safety Coordinator or Assurance Manager, who will in turn notify the Laser Programs Assurance Office contact.

An incident call-out list has been created for the NIF Project. An updated copy of the list can be obtained at the NIF field construction office (Trailer 5977).

III.E.5. DOE Occurrence Reporting Requirements

Depending on the severity of the incident the DOE Occurrence notification requirements for which the University/LLNL are contractually obligated to comply with may be triggered. DOE must be notified of an incident, which LLNL has determined as reportable to them, within two hours of the occurrence of the incident. As such, immediate notifications through the chain of command is essential so that LLNL’s procedures for categorizing and determining if DOE notification is required may occur. The NIF Assurance Office together with the Laser Program Assurance Office

contact, and in consultation with LLNL ES&H Team 2 if necessary, will make the determination as to whether or not an incident is reportable to the DOE.

III.E.6. Investigation Procedures

- All injury, property damage, fire, incidents and accidents will normally be initially investigated by the supervisor in charge of the area of occurrence, who is on duty at time of occurrence. This information is gathered to help to identify cause and to develop/implement corrective actions to prevent recurrence.
- For reporting, investigation, and record-keeping purposes of occupational injuries and illness related to NIF construction activities the following applies:
For NIF contractor/subcontractor personnel the appropriate forms (California State 5020 "First Report of Injury", and a NIF Accident/Incident Investigation) must be forwarded immediately to the Contractor's Safety Representative and NIF Construction Management for review.
For LLNL employees and non-LLNL employees working under the direct supervision of LLNL, a "UC/LLNL SAAR" form shall be used to investigate and document work related injuries and illnesses.
- Investigation results will be reported in writing on the NIF Accident Investigation report form or SAAR. Completed copies shall be sent to the University's representative (ES&H Team 2 Construction Safety Officer), NIF Construction Management, and the NIF Safety Coordinator within 5 working days. When essential information is lacking, the report will be returned to the originator for immediate completion. Information from these report forms will be transcribed into the University/LLNL injury and illness record-keeping system by the LLNL Hazards Control Department, and as required transmitted to the DOE.
- The data generated from accident/incident investigations shall be analyzed, tracked, and trended by contractors having the accident/incident. The information generated will be used to identify cause, trends of unsafe behavior or conditions, and unacceptable practices. Trended data should be used in the elimination of unsafe conditions, to minimize occurrence or recurrence of injuries, and for employee training. The information generated shall be forwarded to the Construction Manager on a monthly basis.
- In the event an injury is or has the possibility of being a fatality, there is serious or fatal injury to a nonemployee, or there are multiple serious injuries or extensive damage to any property, in addition to the above notifications of section III.E.3., **IMMEDIATE** notification will be made to the NIF Project Office, **the insurance carrier safety consultant**, and the insurance broker.
- A serious injury or illness is one which requires worker hospitalization for more than 24 hours for other than medical observation, or in which a part of the body is lost or permanent disfigurement occurs. The scene of any major accident must be secured until documentary, photographic, and physical evidence can be

preserved. No material, machinery, or equipment should be moved until approval is given by the LLNL Associate Director for Laser Programs, or his/her representative, unless the condition or physical position poses an additional hazard.

In the event an incident results in a fatality on the NIF Project site, the University of California Police Department at LLNL shall take control of the incident scene pending investigation by local authorities (i.e., Alameda County Coroner Office and/or District Attorney, OSHA, DOE) having jurisdiction over occupational fatalities.

- All official notifications to the family of an injured worker will be made by the Employer of the injured worker(s).
- Contractors/subcontractors and their employees or agents, LLNL employees and non-LLNL employees are not to discuss with the media any facts, hearsay, or assumptions regarding accident/incidents occurring during the NIF construction project. ALL releases to the news media must be either made by or approved by the University.
- A synopsis of all serious accidents, incidents or potential problems will be distributed to all NIF contractors/subcontractors and are to be addressed in a Special Safety Incident Investigation Meeting. This meeting, in which all contractors/subcontractors will be represented, shall be conducted within 48 hours of the incident, to formally discuss common hazards, serious accidents or where information requires timely communication. Pertinent information from this meeting shall be passed on by contractors/subcontractors to their employees.
- All NIF contractors/subcontractors shall provide modified duty and case management procedures for all injured employees.

III.E.7. Injury Report Retention

All reports pertaining to injury or illness of employees or nonemployees shall be preserved and not destroyed without approval from the Contractor's Safety Representative and NIF Project Management.

Reports will not be released to anyone without approval of the NIF Safety Coordinator, and will be kept on file for five years following the date of occurrence.

Injury and Illness records on LLNL employees are covered by the DOE moratorium on the destruction of epidemiological records and will be maintained in accordance with University and Laboratory policies.

III.F. Privacy Notification

Any person working on the NIF Project site who is requested to provide personal information for accident or incident investigation purposes is to be notified, in accordance with University policy, of the following:

**University of California
Lawrence Livermore National Laboratory
Privacy Notification**

The Laboratory collects and maintains information about each employee for use in miscellaneous payroll and personnel matters. The following notice with respect to that information is provided as required by the California Information Practices Act of 1977:

The principal purpose for collecting and maintaining this information is for use in matters such as but not limited to payment of earnings, withholding of State and Federal taxes, effecting authorized payroll deductions, reimbursement for travel costs, and the administration of compensation, benefits, health and safety, and general personnel programs. Laboratory and University policy and State and Federal statutes authorize the collection, maintenance, and use of this information.

The furnishing of the information requested for these purposes is mandatory—failure to provide such information will delay and may prevent the completion of payroll and personnel actions. The information furnished will be used by various Laboratory and University departments for the above-described purposes and will be transmitted to Federal and State governments as required by law.

Individuals have the right to review their own records in accordance with Laboratory and University policies. Information on these policies may be obtained from the Human Resources Manager.

The officials responsible for maintaining the above-described information are the Human Resources Manager, the Accounting Officer, the Business Services Manager, the Assistant Laboratory Director for Plant Operations, the Head of the Hazards Control Department, the Head of the Health Services Department, and the Manager of Administrative Information Services.

The above notification may be incorporated into the NIF Accident/Incident form or provided separately to the individual.

III.G. NIF Accident/Incident Investigation Form**NIF CONSTRUCTION PROJECT****ACCIDENT/INCIDENT INVESTIGATION FORM****PERSONAL INFORMATION**

1. Name of Injured _____ Date of Hire ___/___/___ Date of Birth ___/___/___
 Prime Contractor _____ Subcontractor _____
 Job Title _____ SS# _____ - _____ - _____
 hr/monthly _____ Telephone # _____ - _____ - _____
2. Injury Date: ___/___/___ Time: ___:___ am/pm
3. Name of Supervisor _____ Telephone # _____ - _____ - _____
4. Accident Location: (Specific Site Location with reference points): _____

5. Type of Injury: _____
 _____ Body Part(s) _____ Signs/Symptoms _____
6. Type of Care: None___ First Aid___ Medical Treatment _____
 Treating Hospital/Clinic/Physician? _____
7. Workdays Lost _____ Workdays Restricted _____
8. Permanent transfer to different job because of accident? _____
9. Terminated because of accident? _____
10. Has employee returned to work with no further anticipated workdays lost or restricted? Yes___ No___ (Date & Time) _____
11. Employee trained for work? Yes___ No___ When? _____
 _____ Date Trainer: Name/Title _____
12. Employee authorized for work? Yes___ No___ If yes, _____
 _____ Authorizing Person: Name/Title _____
13. Length of experience in this job/equipment? _____
14. Length of present employment at the NIF? _____

ACCIDENT DESCRIPTION

15. Work Being Done: _____
 _____ Type of Work _____ Equipment, tools, material in use _____
16. Accident Description: (who, when, where, how, why) _____

17. Result of Site Investigation: (area coned off, new procedures) _____

18. Result of Tool/Equipment Investigation: (defective, wrong tool) _____

19. Primary Accident Cause(s) & Contributing Factors: _____

WITNESS(ES)

20. Name & job position: _____

Relation to injured party: _____

Description of incidents leading to injury/illness: (one-on-one interview) _____

RECOMMENDATIONS

21. Job covered by: a. Job Hazard Analysis? _____

Bulletin, Document, Manual, Instruct.

b. Safety rule/regulation: _____

Handbook, Bulletin (Citation)

22. Is the procedure/rule/regulation adequate? Yes _____ No _____

23. If no, recommended change(s): _____

24. Recommendation to prevent similar accidents: _____

25. Investigator(s): _____

Date: _____

26. Reviewed by: _____

Title _____

Date ____/____/____ ____/____/____ ____/____/____

27. Safety Committee review & analysis: (suggestions for prevention of recurrence) _____

28. New procedures/training/controls implemented? Date ____/____/____ List changes _____

29. Additional information and/or comments: _____

III.H. Safety-Related Problems and Deficiencies

III.H.1. Reporting

Safety-related problems and deficiencies must be identified and reported to management for resolution. Any person working on the NIF Project is empowered to report any unsafe condition or unsafe work practice to his/her organization, the Construction Manager, NIF Project Management, LLNL, or DOE without fear of reprisal. These reports should be forwarded in a timely manner to the NIF Construction Manager.

III.H.2. Feedback and Improvement

Various organizations and individuals have assigned responsibilities to conduct routine and formal safety inspections and audits of the NIF work site and the work activities on the work site. With that responsibility comes the duty to establish a method(s) for analyzing, tracking, trending, and correcting safety-related problems and deficiencies associated with their operations or the NIF Project.

Each organization is responsible for developing and maintaining a process by which safety-related problems and deficiencies are analyzed, tracked, trended, and corrected. Trended data should be used in the elimination of safety-related problems and deficiencies and for employee training. The information generated shall be forwarded to the Construction Manager on a monthly basis. The insurance broker will provide monthly loss analysis reports (see Section I.F OCIP) and other special reports as developed, which will contain trending information.

Serious safety-related incidents are reported and reviewed as described in Section III.E. above. Root-cause analyses for occurrences are to be performed as required in Sections III.E.3 and 5 above.

IV. Drug Free Workplace Program

IV.A. Applicability

All NIF construction contractors/subcontractors are required to adhere to the Drug/Alcohol Policy set forth in section IV.B and IV.C of this document.

All Laboratory employees of the University working on the NIF Project site are covered by current LLNL policy.

All employees of other contractors/subcontractors working under the direction of LLNL on the NIF Project site are covered by the applicable provisions of their individual contracts with the University/Laboratory.

IV.B. NIF Drug Free Workplace Policy Overview

Being under the influence of a drug or alcohol on the job may pose serious safety and health risks not only to the user but to all those who work with the user. The possession, use or sale of an illegal substance or use of alcohol in the workplace also pose unacceptable risks for safe, healthful and efficient operations. The NIF Project Drug Free Workplace Program and Policy prohibits the possession, distribution, use, consumption or being under the influence of unauthorized alcohol, illegal and unauthorized substances (synthetics, designer, and other harmful substances) in order to provide a safe and healthful environment for our employees, the contractor's employees, customers, suppliers, visitors and members of the general public.

IV.C. Requirements for NIF Contractors/Subcontractors

IV.C.1. Substance Testing Program

The Contractor/Subcontractor shall adopt and enforce a substance testing program at no cost to LLNL, which complies with appropriate federal regulations and utilizes a Department of Health and Human Services certified laboratory. Under the substance testing program, the Contractor/Subcontractor shall test all new employees within the first 5 days of their employment at the site.

The Contractor/Subcontractor shall also test its employee upon reasonable suspicion of that employee's use of controlled substances, or abuse of legal substances on an LLNL site or after that employee's involvement in a NIF construction accident.

The Contractor/Subcontractor shall review the test results and the circumstances, and determine what action, if any, should be taken. The Contractor/Subcontractor

shall advise the Construction Manager of any positive test results, and of its determination as to action, if any, to be taken. LLNL may deny access to the LLNL sites to any individual who tests positive on a substance screening test.

IV.C.2. Definitions

As used herein, the following terms shall have the indicated meanings:

“Alcohol” means the intoxicating agent in beverage alcohol, ethyl alcohol, or other low molecular weight alcohols including methyl and isopropyl alcohol (reference 49 CFR 382.107).

“Controlled Substance” means a controlled substance in Schedules I through V of Section 202 of the Controlled Substances Act (21 U.S.C. §812), and as further defined in the regulation at 21 CFR 1308.11-1308.15.

“Substance Testing” means laboratory testing for legal or illegal substances in the urine or for alcohol in the blood or on the breath.

“Legal Substance” means: (1) Controlled substances that are prescribed or administered by a licensed physician; (2) Over-the-counter purchased legally; and (3) Alcoholic beverages.

“Illegal Substances” means controlled substances listed in 21 U.S.C. §812, which are not legally obtainable, or those which are obtained illegally.

V. Pre-Phase Planning—Integrated Work Sheets, NIF Site-Specific Safety and Health Plans, Job Hazard Analysis, Operational Safety Plans, and Work Authorization

V.A. Scope

When coupled with a clearly stated scope of work, pre-phase planning ensures that hazards are identified and addressed and that suitable safety documents (e.g., a JHA or OSP) are prepared to prevent or mitigate these hazards. Pre-phase hazard identification and evaluation, planning and development of work controls, and work authorization are three of the Core Functions of the ISM process. This section outlines the purpose for and methods of pre-phase planning that will be required for each activity involving operations and/or work at the NIF Project site.

V.B. Purpose

The purpose of pre-phase planning is to prevent unnecessary hazards that are likely to occur during construction of the NIF and to make sure each group performing an operation/activity will have the necessary material, equipment, and personnel on hand when needed. Due to the speed at which construction jobs proceed, it does not allow a single operation/activity to continue long enough to become safe through trial-and-error. To cope with safety problems peculiar to the construction industry, these procedures have been established so construction management can predetermine the hazards and develop an appropriate plan to prevent the hazards from becoming accidents.

The steps in pre-phase planning to ensure the proper preparation of safety documentation are shown for both contractors/subcontractors and LLNL/non-LLNL organizations (see Figure 3).

V.C. Planning

It is the responsibility of the NIF and LLNL Supervisors and the contractor's/subcontractor's safety representative to ensure that pre-phase planning is done for all divisions of work operations and activities performed on the NIF site.

Pre-phase planning includes the preparation of a Job Hazard Analysis (JHA) which shall be developed by the field supervisory personnel who will be actually running the job(s) or operation(s) that is being preplanned. It is vital that all contractors/subcontractors involve their subtiers in this pre-phase - JHA process. This analysis will be done on the attached JHA form, Form S+H 5-1 Job Hazard Analysis.

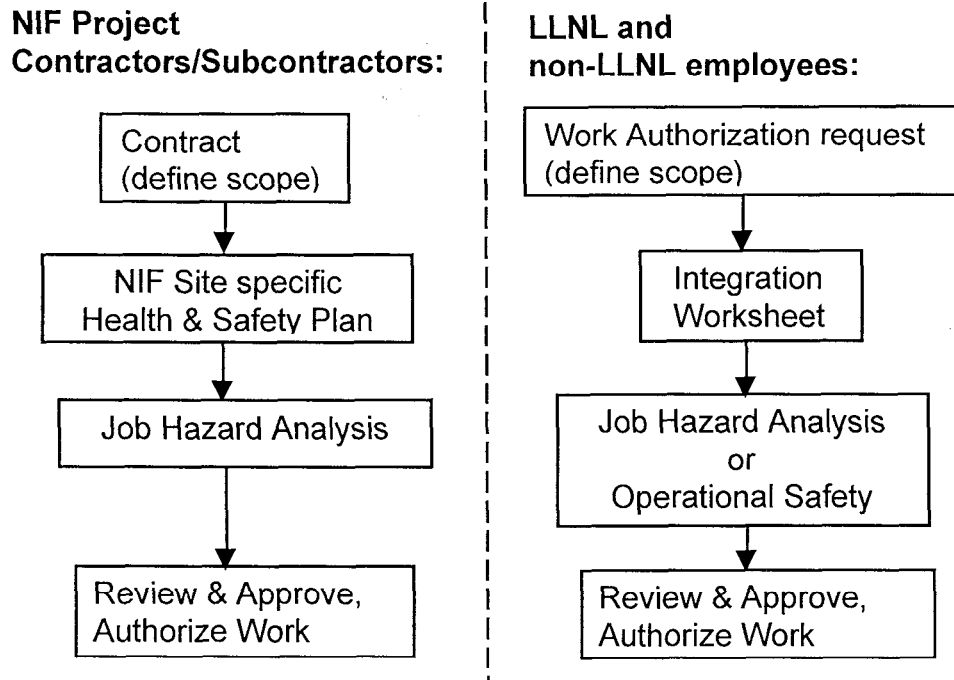


Figure 3. Correspondence of Work Authorization request/approval sequence for NIF Project Contractors and for other employees.

The supervisory personnel referenced above for each respective group or contractor/subcontractor/subtier will consult and coordinate the preparation of pre-phase plans with the Construction Manager (or cognizant System Manager) or their designee and the Construction Safety Officer to ensure acceptable plans. In addition, the plans will be reviewed and updated at reasonable periods of time to include unanticipated hazards and changes in job conditions.

V.C.1. Supervisor's Pre-Job Safety Planning and Hazard Recognition Checklist

From his/her position of broad coverage, the supervisor must spearhead planning, working, and vigilant surveillance to eliminate hazardous conditions and actions that might result in bodily injury, property damage, and public liability. The following is a partial checklist of functions that the supervisor (by reason of his/her position) must personally initiate and follow up:

V.C.2. Establish Project Safety Policy

1. Firmly communicate, implement, and back the NIF/LLNL Safety policy throughout project.
2. Establish special rules for specific projects and publish them for your crew(s) and/or subcontractors.
3. Attend and participate in tool-box/tail board safety meetings.

4. Comply with OSHA's ruling that a qualified and certified first-aid person be available on-site at all times when work is in progress. Valid First-Aid Cards must be present.
5. Provide owner, government representative, and visitor protection.
6. Enforce vehicle safety policy and energy conservation.
7. Conduct new employee orientations.

V.C.3. Planning for safety

1. Use the work schedule to communicate safety issues to keep people in the various work activities.
2. Do not create or increase hazardous conditions via the schedule through lack of advance recognition of hazards. Lay out project to include:
 - a. Safe and efficient pedestrian and vehicle access, crane-way access, reaches, loads, and crane certifications.
 - b. Provision for employee parking in designated areas.
 - c. Yard layout to provide security and reduction of fire hazards.
 - d. Planned, orderly storage and security of construction materials and equipment.
 - e. Signs for live underground and overhead utilities.
 - f. Survey and control of electric utility hazards.
 - g. Safety-factored shoring, sheeting, and bracing.
 - h. Vertical and horizontal member checks.
 - i. Security from wind and flood.
 - j. Selection of proper crane for application.
3. Eliminate hazards to the public:
 - a. Barricades, signs, and fences.
 - b. Cave-ins, flooding, dust, and wind.
 - c. Insecure loads, binders, and overhangs.
 - d. Restricted, rough roadways.
 - e. Poor sight distances and blind corners.

V.C.4. Mitigation of Property Damage

1. Property owned by others:
 - a. Overhead and underground utilities.
 - b. Cave-in and flooding.
2. The project you are constructing:
 - a. Storm, freeze, and wind damage.
 - b. Signing temporary and permanent "hard to see" installations (pipe) (wire).
 - c. Fire protection and housekeeping.

- d. Flooding—storm and manmade.

V.C.5. Special Supervisor Considerations

1. Job security (including nonworking hours).
 - a. Fire, earthquake, flood, wind, and freeze.
 - b. Security, lighting, flashers, and locks.
 - c. Internal and external theft and vandalism.
2. Special alert about backing equipment (lifts & mixers).
3. Pacesetting hazard recognition and accident prevention for the project.
4. Indoctrination of new hires.
5. Avoidance of “lone worker.”
6. Training engineer, craft superintendents, foreman, and workers to participate in hazard recognition, along with efficient high production, morale, and schedule consciousness.
7. Awareness of Laboratory service equipment and Laboratory bike traffic movement and right-of-ways.

V.C.6. Pre-Phase Meeting

After the responsible supervisory personnel have completed their necessary preparations and have a JHA written out on the attached form, the Construction Manager (or cognizant System Manager) will call a pre-phase meeting. This meeting will always be attended by the supervisory personnel of the LLNL group(s) or contractor(s)/subcontractor(s) submitting the plan, the Construction Manager, cognizant System Manager, a Construction Safety Officer, and any other supervisory personnel responsible for that particular phase of work. Copies of the written plan will be distributed to all those present, and the originator of the plan will be asked to go down his/her list of items, explaining each one and allowing comments from all those present. Under no circumstances is work to be allowed to begin without first having the JHA reviewed and accepted.

A minimum of five minutes will be used at the start of every shift to discuss the work for the day and the safety planning, precautions, and requirements to be taken to mitigate the risk of an injury. This activity shall be documented. All changes to work activity throughout the day will require the same safety and preplanning commitment.

V.D. Integration Work Sheets (LLNL and non-LLNL Employees)

An Integration Work Sheet (IWS) ensures the front-end identification of all hazards associated with a work activity. The IWS evaluates the hazards and the complexity of the activity to determine whether a JHA or an OSP is to be prepared. The organization authorizing a work activity is responsible for ensuring that an IWS is prepared,

reviewed, and approved prior to performing any work. Only LLNL and non-LLNL employees proposing operations or activities on the NIF Project site, including laydown and construction support areas, are required to prepare an IWS.

Contractors/subcontractors will prepare NIF-Specific Safety and Health Plans and JHAs as required.

V.E. NIF Site-Specific Safety and Health Plans

V.E.1. Requirement

All Facility and Infrastructure work at the NIF Construction Project will be performed in compliance with the requirements of this safety program, the CSP. The CSP is the master ES&H plan for the project. Every contractor/subcontractor is required to submit a written NIF site-specific Health & Safety Plan, except as modified in Section V.E.1.1. Each lead contractor/subcontractor shall assure that all subcontracted work that they initiate is within the scope of their Health & Safety plan or that their subcontractor has an appropriate Health & Safety Plan.

The NIF Construction Management shall ensure that every construction purchase order or subcontract includes the requirement for a Subcontractor "Health & Safety Plan" submittal, except as modified in Section V.E.1.1. The Health & Safety plan submittal will be routed to ES&H Team 2 for review by the cognizant Construction Manager, System Manager, or NIF Project Office. It is the responsibility of the cognizant Construction Manager or System Manager to ensure that work does not begin before submittals are reviewed and accepted by both ES&H Team 2 and the NIF Project Office.

LLNL and non-LLNL employees and their contractors/subcontractors, visitors, etc., performing work at the NIF Project will not normally be required to submit a written NIF-specific Health & Safety Plan. They shall comply with the requirements of the CSP. Training courses will be provided to assist LLNL and non-LLNL employees and their contractors/subcontractors, visitors, etc., to learn these requirements. NIF Project Management shall decide whether written health and safety plans are required of these groups.

V.E.1.1. Activity Level Requirements

Non-LLNL employees including contractors, subcontractors, vendors, and suppliers who have activity inside the NIF site will have the activity categorized for safety requirements. As a guideline, the categorization will be based on the size of contractor, duration of operation/activity, and the complexity of the operation/activity/surroundings. Requirements will be separated into two divisions, Level I and Level II (see Table 1). The determination will be made by the Construction Safety Officer assigned to Facility and Infrastructure prior to the Request for Proposal (RFP). The Facility and Infrastructure System Manager will review and concur with Level I designations.

- Level I: Activity involving fewer than 10 employees on site, noncomplex/minor-hazard activity, short duration—less than 10 days on site.*
- Level II: Any contractor operation of significantly complex/hazardous activity, or greater than 10 employees on site, or long (continuous) duration—more than 10 days on site.
- Noncomplex/minor hazard: An activity that if not properly managed would not reasonably be expected to result in bodily injury, environmental impact, property damage, or legal liability.
- Significantly complex/hazardous: An activity that is significantly complex or significantly hazardous so that if it were not properly managed, there is a reasonable probability of death, severe bodily injury, severe adverse environmental impact, significant property damage, or substantial legal liability.

* Note: For those cases in which the risk to a Level I contractor is increased due to conditions in an area, the System Manager in charge of that area will require reevaluation and modification of the JHA, as appropriate.

Table 1. Activity Level Requirements

Requirement	Level I	Level II
Competent Safety Representative	#	X
10-hour OSHA class	##	X
Site-Specific Safety Plan	+	X
Job Hazard Analysis	X	X
Injury and Illness Prevention Program	X	X
Compliance with CSP for the NIF	X	X

X Required

Will be provided by Facilities and Infrastructure, contractor to provide designated safety representative.

10-hour OSHA course for competent safety representative/supervision recommended but not required.

+ Site-specific safety plan not required.

V.E.2. Plan Content

The written Health & Safety Plan shall inform the reader of the work to be performed and the type of construction safety required for the work. Each Health & Safety Plan shall conform with OSHA requirements, good safety practices, and the requirements outlined in the CSP for the NIF. In addition each subcontractor plan shall conform with the requirements of this document, and at a minimum, address the

applicable safety requirements for NIF construction activities that are contained in Appendix A of this document. The items identified in Appendix A should not be considered an “all inclusive” list of subjects that should be addressed in an acceptable Health & Safety Plan for the NIF construction project.

V.E.3. Plan Acceptance

As required by LLNL policy, the “Health & Safety” plans of each lead Subcontractor has to be reviewed and accepted by the HCD (represented by ES&H Team 2) before work is allowed to begin. In addition, the NIF Project Office shall also review and approve the plans. Subcontractors are encouraged to submit their written plans early to avoid possible delay in beginning their work.

In addition to “Health & Safety Plans,” certain task-specific submittals (e.g., fall protection plans, scaffolding plans, trenching plans, confined space plans, respirator program, etc.) will be required of the subcontractors for HCD. Such submittals must be reviewed and concurred with by HCD prior to the start of the specific task by the subcontractor. Refer to the topical areas in Appendix A for task-specific safety-related subcontractor submittals.

V.F. Job Hazard Analysis (JHA)

The JHA is used to document the process of identifying and analyzing the steps of a work activity for hazards and control measures prior to the work being performed. A JHA identifies the task steps that need control, identifies the hazard(s), establishes the control action(s), and defines specific training prerequisites. A JHA contains (as a minimum) the sequence of job steps, the potential hazard of each, and the required controls. All groups working on the NIF site including NIF Elements, LLNL Plant Maintenance and Operations and their contractors, supplemental labor, labor only contractors, and contractors/subcontractors and their subtiers are responsible to complete a JHA form one week prior to performing the operation and/or construction activity. A review and acceptance of the JHA by the NIF Construction Manager must be obtained prior to performing any on-site work activity. LLNL OSPs are acceptable as a substitute for a JHA. Please refer to Form S+H 5-1 Job Hazard Analysis at the end of this section.

V.G. Operational Safety Plans (LLNL and non-LLNL Employees)

An OSP may also be required for some activities. OSPs are LLNL-generated safety documents required for individual, limited-term activities unless the ES&H issues are adequately covered by the LLNL *ES&M Manual* or other LLNL documentation. Contractors/subcontractors will not be required to prepare OSPs unless required by their contracts. LLNL employees should consult with ES&H Team 2 when determining the necessity of preparing an OSP. Note: OSPs are acceptable as a substitute for a JHA.

V.H. Work Authorization (LLNL and non-LLNL Employees)

Work authorization is a work control process under the Facility and Infrastructure System Manager used to ensure personnel and equipment safety during work on the NIF Project site that is consistent with ISM. Note: Work authorization does not apply to Facility and Infrastructure directly controlled contractors and subcontractors.

On the NIF Project site, or for work outside the site boundaries that could have a potential impact to the NIF site activities, an ICF/NIF Work Authorization Form (WAF) is the process by which System Managers and various LLNL organizations (e.g., Plant Engineering), commercial vendors (e.g., laser repair technicians), or groups request, and following review, obtain authorization to access the NIF site to perform the work. It is a request/authorization process between the requestor and the Facility and Infrastructure System Manager that addresses the five Core Functions of ISM (work is defined, hazards analyzed, controls developed, work is performed as prescribed, and feedback for improvement is carried out). In the WAF, the facility or area in which the work will take place, the hazards associated with the activity, and the individual that will be supervising the work activity are identified to ensure coordination of the requested work with other concurrent on-site work. The requestor must complete and receive approval of the WAF from the Facility and Infrastructure System Manager prior to starting work on the NIF site. The procedure is outlined in the NIF Project Control Procedure 5.8.

FORM S+H 5-1—JOB HAZARD ANALYSIS

JOB HAZARD ANALYSIS		Date:
Contract: (if applicable)		Phase:
LLNL Group/Contractor/Subcontractor/Subtier:		Location:
NIF Element:		Location:
ACTIVITY OPERATIONS	UNSAFE CONDITION, ACTION or OTHER HAZARD	PREVENTATIVE or CORRECTIVE ACTION THAT WILL BE TAKEN

 CM Concurrence

 LLNL Group/Contractor/Subcontractor Concurrence

 Subtier Concurrence

VI. Training

VI.A. General requirements

VI.A.1. Bulletin Board

A bulletin board shall be placed prominently next to the Construction Site Office or as otherwise directed by the cognizant Construction Manager or NIF Project representative. This board shall post the following bulletins:

- Emergency phone numbers: Livermore—dial 911 on site and 447-6880 from outside the Laboratory or Cellular Telephone.
- Dates and times that supervisors' safety meetings will be held (minimum of one per week).
- Dates, times, and places of tool box meetings, and requirements for attendance (minimum of one per week).
- The required DOE announcements and bulletins.
- Miscellaneous safety posters (DOE, LLNL, Worker's Compensation, etc.).
- Locations of on-site MSDSs.

VI.A.2. Safety Meetings

Safety meetings shall be held weekly for all employees. The purpose of these meetings is to educate and train employees and develop the proper safety attitude in the performance of their jobs. Proper handling of hazardous materials shall be covered prior to their use on the job site. Attendance records shall be maintained at the job site.

VI.A.3. First-Aid Stations

All personnel shall also be instructed in emergency procedures, first aid, the location of the NIF first-aid station, and the location of the On-site Medical Facility as well as where the off-site Occupational Health Clinic is located for contractors/subcontractors.

VI.B. Guidelines for Safety Training Meetings

VI.B.1. Weekly Basis

The supervisor is responsible for preparing and conducting safety training meetings for employees on a weekly basis. Special safety meetings should be conducted as soon as possible when notified by the Construction Management of serious accident, incident or potential problem on-site. Contractors/subcontractors, LLNL and non-LLNL

employees will be notified with pertinent information concerning these incidents where a common hazard exists or information is necessitated.

VI.B.2. Essential Element

These meetings are an essential element of safety and health training. It is a proven fact that projects which conduct good meetings attain better safety records than those that have poor, or no safety meetings.

VI.B.3. Guidelines

In order to assist in the preparation of material, and in presenting a safety training meeting, the following guidelines are provided.

- a. Preparing for the meeting
 1. Select the topic for the meeting several days in advance so that you will have a chance to become familiar with the subject to be discussed. You should be able to present the talk in a convincing manner without reading it.
 2. Schedule the meeting at the same time every week, if possible, and hold it right in the work area. These meetings are generally 5 to 15 minutes in length so seating is not important. However, make sure everyone can easily see and hear you. A good time to hold the meeting is just after shift begins or immediately following the lunch break.
 3. Just prior to the meeting, gather all the material and/or equipment you need. When possible, use actual demonstrations to illustrate your points. For example, if you are talking about fire extinguishers, have one with you to show what it looks like and how it is used. Have a mushroomed tool head or a broken hammer handle to show how they can cause accidents. If necessary, get someone to help you.
 4. The entire crew, if possible, should be present before the meeting is started.
 5. Safety meeting topics are available from Construction Management.
- b. Conducting the meeting
 1. Start on time. You may lose employee interest if unnecessary delays occur.
 2. Make the meeting short and to the point. However, if you get a good discussion going, use discretion about cutting it off too soon.
 3. Start the meeting by complimenting the workers on some recent good work.
 4. Give the talk in your own words.
 5. Get your people to participate in the meeting. The purpose of these meetings is to get workers to think about safety problems. Encourage them to offer suggestions for improving safety in the work area or your craft.
 6. Maintain control. Do not allow the meeting to develop into a wasteful, time consuming "bull session."
- c. Other items to cover if applicable

1. Review any injury or near miss incident any crew member had during the past week or a Special Safety Meeting topic identified by Construction Management. Discuss what the injury was, how it happened, and how it could have been prevented and steps to be taken to prevent reoccurrence.
2. Review safety violations noted during the past week and future avoidances. Discuss the nature of the violation, the danger involved and offer constructive criticism without naming anyone in particular.
3. Review the work planned for the week ahead. Discuss: hazards to avoid or control, safety equipment to be used, and safe procedures to be followed.

VI.B.4. Record Keeping Requirements

- a. Have each employee sign the attendance sheet (Safety Meeting Record, Form S+H 6-1) at the conclusion of the meeting and the supervisor conducting the meeting must sign it. A copy of the Attendance Sheet must be forwarded to Construction Management.
- b. Make certain it is dated and the crafts attending and the meeting location are listed.
- c. Subjects discussed must be covered in detail. "General Safety" is not specific enough.

NIF Project

FORM S+H 6-1 SAFETY MEETING RECORD

LLNL Group/Contractor/Subcontractor _____

Contract # _____

NIF Element _____

Supervisor _____ Date _____

Craft _____ Crew _____

Subject(s) (Briefly Describe) _____

Comments _____

No. of employees on crew _____

No. in attendance _____

Attendee Signatures:

VII. Safety Award Program

VII.A. Purpose

Each Facilities and Infrastructure prime subcontractor of the NIF will be required to institute a Safety Award Program for its construction workers and subcontractors. The purpose of the Safety Award Program is to recognize and commend those employees and construction subcontractors for their noteworthy achievements in accident prevention.

It must be mentioned that all workers at the NIF are expected to assume individual responsibility for performing work safely and for maintaining safety at the NIF Project site. Workers must take a proactive posture for their own safety and their fellow workers.

VII.B. General Qualifications

Awards are to be made available upon completion of a basic minimum time of employment without a lost time or medically treated injury to have occurred. In addition, an applicant for award must not have been involved in a serious equipment or material damage incident.

Positive reinforcement awards for safe work performance should be distributed by various staff upon observation of work activities.

This program pertains to all employees of the prime construction subcontractor and lower tier subcontractors and their employees directly involved in construction operations. The prime construction subcontractor is to develop an awards program to apply to all workers and lower tier subcontractors performing work on the specific construction package under contract to the prime construction subcontractor.

VII.C. Applications

Notification should be given that anyone qualifying should notify the Safety Representative of the prime construction subcontractor responsible for the package on which the work was performed. The records will be checked against personal injury and property damage reports and employment records by the prime subcontractor's Safety Representative.

All applications must be signed by the subcontractor's Safety Representative and identified on a Safety Award Application form. Documentation of awards are to be forwarded to the Construction Manager and his/her staff for their records.

Qualified personnel are encouraged to submit applications within a reasonable time following their eligibility. No awards will be made beyond a back date of six months.

VII.D. Award Presentations

The following outline defines the minimal acceptable award program criteria to be developed by the prime construction subcontractor. Each subcontractor is to tailor their safety program based on the type of work involved in their specific scope of work. The purpose of the program is to provide tangible and social awards to all personnel who complete their work in a safe manner and promote a safe professional approach to how the work is accomplished.

1. Award 1 - To be awarded monthly by the foreman at Tool Box/Tailboard Safety Meeting.
2. Award 2 - To be awarded after two consecutive months of safe job performance by the subcontractor's Safety Representative at Tool Box/Tailboard Safety Meeting.
3. Award 3 - To be awarded after three consecutive months of safe job performance.
4. Award 4 - To be awarded after six consecutive months of safe job performance
5. Award 5 - To be awarded at completion of project. All employees completing project within criteria are eligible.
6. Award 6 - To be awarded to individual employee of a subcontractor on a random basis (weekly) by staff for safe work performance/observation during site walk-through/safety surveillance activities.
7. Award 7 - To be awarded to Subcontractor/Crew for safe work performance for achieving specified goal of no lost time/medical care/equipment damage of special safety achievements.

<u>Award Level</u>	<u>Frequency</u>	<u>Award</u>
Award 1	One (1) Month	To be determined
Award 2	Two (2) Months	To be determined
Award 3	Three (3) Months	To be determined
Award 4	Six (6) Months	To be determined
Award 5	Job Completion	To be determined
Award 6	Weekly/Daily	To be determined
Award 7	Monthly	To be determined

VII.E. Eligibility

An employee of the subcontractor should be eligible to receive a maximum of two (2) monthly awards, one (1) two-month, one (1) three-month, one (1) six-month and one (1) job completion award. The random Safe Work Performance Awards are to be determined by the prime construction subcontractor and/or his/her staff.

VIII. Environmental Protection

Environmental protection and environmental management are incorporated as part of LLNL's overall ES&H programs. The environmental policy of LLNL is to conduct operations in a manner that preserves the quality of the environment in compliance with all applicable regulations. Protection of the environment is ensured by a wide range of measures including the following:

Note that provisions for environmental protection are also contained in subcontract language and in other sections of the CSP—see also Appendix A to the CSP.

VIII. A. Storm Water

NIF construction is regulated under the state and federal storm water requirements. The state-issued permit requires that a SWPPP be developed and implemented prior to the start of construction and throughout the construction phase until final stabilization. The Plan includes measures to reduce soil erosion and minimize contamination of storm water runoff. The SWPPP requirement applies to the main construction site as well as other areas associated with construction such as laydown areas for special equipment. Construction contractors are required to attend a LLNL Construction SWPPP class.

VIII.B. National Environmental Policy Act

The NEPA requires that significant federal construction projects undergo an environmental review of the proposed project. The NIF has undergone such a review of the overall project, however, new smaller activities are reviewed to ensure that they fit within the umbrella of the overall project review. NIF Project Management should provide as much prior notice as possible of future new construction activities, so that a NEPA analysis can be conducted in a timely manner.

VIII.C. Digging

Anyone who is planning to dig, excavate, or drill into soil must contact the LLNL Environmental Operations Group, ES&H Team 2 Environmental Analyst, and the LLNL Environmental Restoration Division to determine whether the area has been previously approved for such digging, or, requires a site evaluation for potential buried waste. The Environmental Analyst will characterize and provide guidance for the management of any excavated materials such as soil, asphalt, and concrete. If waste materials are encountered in an excavation, all digging in the vicinity of the find shall

stop until the LLNL ES&H Team and other environmental staff can inspect the materials and approve the resumption of work.

VIII.D. Historical/Archeological Materials

If historical/archeological materials are encountered in an excavation, all digging in the vicinity of the find shall stop until the Laboratory Archeologist can inspect the materials and approve the resumption of work. Examples of such materials are stone tools, mortars/pestles, shells, bone, human burials, foundation materials, square nails, and glass. Any necessary mitigation measures to protect significant unexpected discoveries will be developed and implemented in conjunction with DOE, the State Historic Preservation Office, and the Advisory Council on Historic Preservation.

VIII.E. Hazardous Materials

Oils, paints, solvents, fuels, and similar chemicals must be stored so that they do not spill onto the ground. If a spill of such material occurs into the environment, the LLNL EPD should be notified immediately, so that a cleanup can be initiated. An LLNL Environmental Duty Officer is on call 24 hours/day. Contractors must provide a list of all chemicals, to be left on site by the contractor, to the EPD ChemTrack Group so that the chemicals can be bar-coded for tracking. When a work contract has been completed, there shall be no unauthorized hazardous materials or hazardous waste left behind at the job site. All hazardous wastes must be segregated from municipal trash and managed appropriately according to federal, state, and local regulations and LLNL waste management policies. Additionally, trash from lunch areas, etc., should be discarded in appropriate waste containers. Recyclable materials such as paper, cardboard, and wood must be managed appropriately in recycling bins.

VIII.F. Air Pollution

Work should be conducted so that dust generation and odor nuisance is minimized. If there is a potential for such air quality problems, appropriate control measures should be approved by project management in advance of the work. Any portable internal combustion generator greater than 250 horsepower must have an air permit before it is used.

VIII.G. Endangered Species

Project managers should ensure that work is conducted in a manner consistent with the protection of endangered species on the site. The required protective measures are defined and described by LLNL wildlife biologists and communicated through project

managers. The LLNL wildlife biologist must be contacted to initiate a survey for any endangered species that may be impacted by the project prior to the start of construction activities in new locations.

Appendix C

Facility and Infrastructure Laydown and Construction Support Areas

For the purposes of determining where the requirements of the CSP for the NIF apply, the NIF Project site includes the following Facility and Infrastructure laydown and construction support areas:

Near	Description	Planned Use
Helicopter Pad	Target Chamber Fabrication Area, fenced dirt and paved parking lot laydown and fabrication area, temporary metal (tank) building	Fabrication of Target Chamber, outside staging and storage of large Special Equipment (SE) hardware prior to installation, crane staging and assembly / disassembly
B298	3-acre graveled and fenced laydown area	Outside staging and storage of large SE hardware prior to installation, crane staging
B494	Fenced enclosure in parking lot to the south of B494	Outside staging and storage of large SE hardware prior to installation
B592	1.7 acres to the south of B592, fabrication and laydown areas	Fabrication and outside storage, cleaning and staging of large SE hardware prior to installation, crane staging and assembly / disassembly

Other laydown , warehouse, and assembly areas associated with the NIF are controlled by one organization and do not have the interorganizational interfaces or complexity that exist at the NIF Project site. These areas are not addressed in this CSP. They will be treated as Program/Institutional areas, and all procurements involving subcontractor work at these areas will contain the appropriate ICF/NIF Institutional ES&H requirements.